Socioeconomic Factors Affecting Non-Timber Forest Product Collection In The Komi Republic, Russia

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ABSTRACT

There is continued interest in the effects of socioeconomic factors on the collection of non-timber forest products (NTFPs) across the world. Studies in both developing and developed countries have found that, socioeconomic factors can describe why and how stakeholders collect NTFPs. This study was conducted to determine key socioeconomic factors that influence the collection of non-timber forest products in the Komi Republic, Russia, which is historically, politically, ecologically, economically and socially different from both developing and developed countries. This study used qualitative methods (participant observation, focus groups, informal interviews, document review) and quantitative (questionnaires) methods. The results indicated that, in the Komi Republic, gender affected the collection of firewood and chaga, while educational level affected the collection firewood, berries, birch bark and birch sap. However, age, occupational type, household size and income level did not affect the collection of NTFPs. The study found that while women and men collect NTFPs for the same reasons, they use NTFPs differently within the household. The study also found that culture and alcoholism have a significant effect on NTFP collection. The results of this study contribute to the body of knowledge on the general role of NTFPs in rural livelihoods and key socioeconomic factors that affect NTFP collection in the Komi Republic.

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Chapter One
Introduction

1.1 Non Timber Forest Products and Rural Livelihoods

This is a study of non-timber forest product (NTFP) collection within rural households in the southern Komi Republic, Russia, which is a unique part of the world that shares socioeconomic characteristics with both developing and developed regions. The results of this study contribute to the general understanding of the role of NTFPs in rural livelihoods and the socioeconomic factors that affect NTFP collection in the Komi Republic.

Common definitions of non-timber forest products (NTFPs) include: by-products of forests, minor forest products, non-wood goods and benefits, non-wood goods and services, other forest products, secondary forest products, special forest products and non-wood forest products (FAO, 1999; 2006). These alternative terms for NTFPs vary with regards to what products and services they include or exclude. For example, some terms include fuel wood, wildlife, recreation and other services, while others do not. For the purposes of this thesis, NTFPs are forest resources that exclude timber, lumber, and wood chips, but include fuel wood and, "non-wood materials derived from trees, shrubs, forbs, non-vascular plants, fungi and micro-organisms that live in forest or grassland ecosystems (USDA Forest Service, 1995 as cited in Emery, 1998)."

Non-timber forest products are important to the livelihoods of rural people across the world (Ros-Tonen and Wiersum, 2005). However, despite the fact that people in developed, temperate, and boreal regions collect and use NTFPs, research is still concentrated on underdeveloped tropical countries (McLain and Emery, 2001) where dependence on NTFPs

tends to be the highest (Thadani, 2001). In developing regions such as Africa, Asia and Latin America, rural households are generally located in remote areas, are poor, have low levels of financial and physical capital, and are at least partially subsistence oriented (Belcher et al., 2005). Non-timber forest products play an important role in meeting the subsistence needs of these rural dwellers, represent one of the rare sources of cash income, and serve as a social safety net during difficult economic times (Shackleton and Shackleton, 2004; Ros-Tonen and Wiersum, 2005, Belcher et al., 2005). As Pimentel et al. (1997) stated, "Many harvest and use NTFPs for a wide variety of purposes that enhance their livelihoods, and help them purchase food and other vital necessities (pp. 91-92)." Although people's dependence on forests varies in different locations, NTFP collection is generally a part-time, seasonal activity that is complementary to other livelihood and wage earning pursuits (Ros-Tonen and Wiersum, 2005).

Non-timber forest products are also important to the livelihoods of rural people in developed regions. For example, Dobble and Emery (2001) found that NTFPs are important to the livelihoods of people in rural areas of the eastern United States where employment is seasonal, and unemployment rates tend to be high. There are several ways in which NTFPs contribute to livelihoods in the United States. Carroll et al. (2003) found that harvesters had a mixture of motivations for collecting NTFPs in their study of huckleberry gathering, in northeast Washington State and northern Idaho. They found that people collected NTFPs for cultural reasons, household use, income supplementation, and fulltime income generation (Carroll et al., 2003). Non-timber forest product gatherers in Scotland, also collect for a variety of reasons. In Scotland, the majority of the NTFPs are gathered for household consumption, to give away as gifts to friends and family members, and for sale through the

informal economy at venues such as craft fairs (Emery et al., 2006). Similar findings were reported in Finland, where wild berries are collected mainly for domestic use, with only about a quarter of the berries being collected for sale (Saastmoinen et al., 2000). The original subsistence oriented motivation for gathering in Finland has been largely replaced by recreational motives, although income generation also continues to be important (Saastmoinen et al., 2000). These studies demonstrate that people in the developed world collect NTFPs for a variety of reasons. As in other regions of the world, the mix of livelihood approaches that are practiced by households in developed countries, such as the United States, Scotland and Finland varies according to the demographics, and economic state of the household (Emery, 1999).

In order to understand the role of non-timber forest products in the livelihoods of rural people in both developing and developed regions, it is necessary to understand the socioeconomic factors that affect NTFP collection. This is because people in different socioeconomic groups perceive and use NTFPs differently (Shackleton and Shackleton, 2006). These socioeconomic factors include gender, age, educational level, occupational type, household size, income level, ethnicity and others, and have been studied by researchers in both developing and developed regions of the world.

Gender is a factor that affects NTFP collection in many developing countries. Understanding how gender affects gathering is important, because it is a critical factor in shaping resource access and control, which influences the struggle of men and women to sustain viable livelihoods (Rocheleau et al., 1996). Studies report that women and men have different NTFP collection patterns, and often collect different products. In the Philippines, for example, while women collect an estimated 75% of NTFPs, vines and rattan are usually

collected by men (Ella, 2004). In southern Cameroon, it is the women who the collect mushrooms, fruit and nuts (Brown and Lapuyade, 2001). Odebode (2005) also found that women are the primary NTFP gatherers, collecting fuel wood and fodder for both household consumption, and commercial sale in Nigeria. According to Odebode, (2005) women are major actors in the forestry sector throughout the developing world.

In developed regions, the effect of gender on NTFP collection has not been widely studied. One of the few studies that did examine the role of gender in NTFP collection was conducted in the Upper Peninsula of Michigan, in the United States. In that study, Emery (1999) found that women mentioned 40% more non-market uses for NTFPs than did men. Other studies recorded gender (e.g., Emery et al., 2006), however did not focus on it as a factor that may affect collection. These studies, in both developing and developed regions, indicate that gender is an important factor to consider, because it describes the roles of women and men in NTFP collection.

Age is another factor that affects NTFP collection. In many of the studies conducted in developing regions, the age of gatherers was linked to the types of NTFPs they collect and how active they were in collection. For example, Chetry et al. (2003) found that 16% of fuel wood collectors in the Sonitpur district of Assam, India, were children, with the majority of fuel wood collectors in the 16-30 year-old age group. Ndoye and Tieguhong, (2004) also note the contribution of children in the collection of fruits, leaves, nuts, fuel wood and other NTFPs in the Congo Basin. In southern Nigeria, Egbule and Omolola (2005) found that NTFP collectors were women, 27.78% of whom were 31-40 years old and 37.50% of whom were 41-50 years old. At the household level, in the Brazilian Amazon, households with older heads, with the exception of the very oldest, were found to be more involved in the

collection of NTFPs than households headed by younger people (Pattanayak and Sills, 2001). This is similar to the findings of Voeks (2007) in eastern Brazil, where younger individuals show little interest in learning the identities and uses of medicinal plants. As a result of this lack of knowledge, younger people are less likely to engage in NTFP collection than older people (Momsen, 2007).

Age, like gender, has not been widely reported on as a factor that affects NTFP collection in the developed world. In Scotland Emery et al. (2006) collected socioeconomic data to characterize the demographics of gatherers and found that the majority of NTFP gatherers were 45 years old or older. In the U. S. San Bernardino National Forest, respondents reported that 30-35% of fern gatherers were over the age of 60, and 61.9-70% were in the middle age group (26-59 years old). Anderson et al. (2000) used this information to conclude that interest in fern picking in the San Bernardino National Forest was not going to decline in the near term, based on the assumption that old age would not be a factor that prevents NTFP collection for some time. These studies indicate that age affects gathering and is a social factor that can be used to understand NTFP collection in developing and developed regions.

Educational level has also been shown to affect NTFP collection. Studies have shown that NTFP gatherers in developing regions tend to have relatively low educational levels. In Bolivia and Mexico lower levels of education were correlated with NTFP collection as opposed to NTFP processing and production/cultivation (Willem te Velde, 2004). The heads of both commercial and non-commercial NTFP extracting households in north-eastern Honduras had a median education of 3.6 years (McSweeney, 2005). In both of these studies, NTFP collectors appeared to have relatively low educational levels.

Gunatilake (1998) explained this trend by stating that, in general, people with higher levels of education had more opportunities to obtain formal employment and were therefore diverted from gathering activities.

Educational level is a factor that also affects NTFP collection in developed regions. However, the way in which it does so is different than in developing regions. For example, fern gatherers in the San Bernardino National Forest, in the United States, generally had higher average educational levels (beyond high school) (Anderson et al., 2000). This difference between developing and developed regions may exist, because unlike gatherers in Bolivia, Mexico, and Honduras, the primary reason people gather NTFPs in the San Bernardino National Forest is for recreation (Anderson et al., 2000) rather than subsistence.

In many developing nations, NTFP gathering is the main occupation practiced fulltime by tribal and other rural people for subsistence purposes (Tewari, 2001). Agriculture is also a common occupation among NTFP gatherers in places like south-eastern Nigeria (Bisong and Ajake, 2000), southern Cameroon (Brown and Lapuyade, 2001), and the Brazilian Amazon (Pattanayak and Sills, 2001) and Sri Lanka (Gopalakrishnan et al., 2005). In the Peruvian Amazon, residents make their living using a mix of occupations including slash and burn agriculture, fishing and hunting (Coomes, 2004).

In developed regions, people with a variety of occupational backgrounds collect NTFPs. In the study conducted by Emery et al. (2006) in Scotland, respondents were composed of a member of the House of Lords, a biology teacher, a farmer and an unemployed fisherman, among others. In both developing and developed regions however, NTFP collection is often practiced in conjunction with other livelihood strategies (Carroll et al., 2003). Because of challenges associated with employment options and time budget

constraints, occupational type may be a factor that affects the collection of NTFPs in both developing and developed regions.

Household size is a variable that can be examined to determine if the number of people in a household affects NTFP collection activities. According to the theories of Alexander Chayanov, the early twentieth century author of *The Peasant Economy*, the balance between household labour and consumption, is affected by the size of the household, and the ratio of working members and nonworking members (Thorner, 1986). Therefore household size can determine both the number of people requiring livelihood resources, and the labour potential of the household; thus determining the need for NTFPs and household capacity to collect them. Few studies in developing regions, however, mention household size, and when it is mentioned, it is often presented as a simple descriptive statistic without further discussion. For example, Lebbie and Guries (2002) report that household size among palm wine tappers, in Freetown Sierra Leone, varies from three to a maximum of eight but they do not discuss household size any further. Of the few other studies that discuss household size, some find that it affects NTFP collection (e.g., Quang and Anh, 2006) while, others find that it does not (e.g., Summers et al., 2004). Based on the theories of Chayanov, and the results of studies conducted in developing regions, household size is a variable that may affect NTFP collection.

In developed regions, household size is a factor that has not been reported on in NTFP studies. This may be because developed regions have generally capitalist economies and while what Chayanov called "peasant families," or purely subsistence households, may exist, they are not the norm (Thorner, 1966).

It is generally thought that lower income households are more likely to be dependent on the collection of NTFPs. This tendency has been shown by Godoy and Bawa (1993), Gunatilake (1998), and Senaratne et al. (2003). Poor households in Sri Lanka gathered more NTFPs to meet a wide range of domestic needs while NTFPs played a marginal role in rich households (Senaratne et al., 2003). This trend is not universal, however. In the Western Ghats, India, richer households harvested, on average, a higher number of NTFPs than poorer households, although the difference was not found to be statistically significant (Rai and Uhl, 2004).

Income level is a factor in NTFP collection in developed regions as well. However, as in developing regions, study results are contradictory. For example, the results of a 1996 study conducted by Richards and Creasy, in the Klamath National Forest, in the United States, indicated that NTFP gatherers had lower than average incomes (Anderson et al., 2003). In contrast, the results of a study conducted in the San Bernardino National Forest, also in the United States, indicate that NTFP gatherers have higher than average incomes (Anderson et al., 2003). Despite differences in research findings, income level continues to be a factor that is believed to affect NTFP collection in both developing and developed regions.

Ethnicity is a factor that affects NTFP collection in various regions of the world. For the purposes of this study the term "ethnicity" is described as the "variation in cultural expectations and preferences (Anderson et al., 2000)." An example of how ethnicity affects NTFP collection in a developing region can be seen in the study conducted by Narendran et al. (2001) in the Nilgiri Biosphere Reserve, Southern India. Narendran et al. (2001) studied the Kurumba, Irula, Kotha, Paniya, Cholanayaka and Toda ethnic groups and found that

ethnicity was an important factor that affected NTFP collection. Non-timber forest products contributed from 24 to 35% of per capita household incomes among the Todas, while among the Kurumbas, Irulas, Kothas, Paniyas, Cholanayakas, the contribution ranged from 41 to 68% of per capita incomes (Narendran et al., 2001).

As is the case with several other socioeconomic factors, few studies have examined how ethnicity affects NTFP collection in developed regions. An example of a study that did look at ethnicity is that conducted by Anderson et al., (2003) in the San Bernardino Forest. Their study examined NTFP collection by ethnic Korean and ethnic Japanese Americans and found that there were differences between these two groups (Anderson et al., 2003). Study results in developing and developed regions indicate that ethnicity is a factor that may affect NTFP collection.

1.2 Context for the Study of NTFPs in Russia

Russia differs from developing and developed regions, yet shares some characteristics of both (Kuhn and Stillman, 2004). This is reflected by development indicators such as literacy rates, infant mortality rates, estimated earned annual income and life expectancy. For example, while Russia's literacy and infant mortality rates are close to those in developed regions, estimated earned annual income and life expectancy are closer to those in developing regions. The 2000-2004 literacy rate in Russia was 99.4% which was similar to the 98.9% literacy rate in developed regions, and unlike the 77.2% literacy rate of developing regions (UNESCO, 2006). The 2005 infant mortality rate in Russia was 14 deaths for every 1000 live births. This is closer to the infant mortality rate in developed regions, which was 5

deaths for every 1000 live births and unlike that of developing regions where there were 57 infant deaths for every 1000 live births (UNICEF, 2006). However, although the estimated earned annual income of men working in non-agricultural sectors in Russia is approximately two to four times higher than that in developing countries such as India and Cameroon, it is approximately one third of that in developed countries such as Canada and France (UNDP, 2007) and the average life expectancy at birth for both genders is lower in Russia than the average for developing regions (PDDESAUNS, 2007). From 2000 to 2005, the average life expectancy at birth (male and female combined) in Russia was 64.8 years, while the average life expectancy in developing regions was 65.6 years during the same period. In comparison, in developed regions, life expectancy was 74.8 years (PDDESAUNS, 2007).

Despite some similarities, however, there are several key ways in which Russia differs from developing regions. Ecologically, Russia is different from developing regions because it is a generally northern country with the majority of its territory covered by boreal forests (Rossiiskaia Lesnaia Gazeta, 2002) rather than the tropical forests found in developing regions. Russia also has a lower population density, and with its large geographical territory (1,707,540,000 ha (EarthTrends, 2003)), it has only recently begun to experience population pressure and resource limitation (Kollontai, 1999). In 2005, for example, population density in the Russian federation was 8.4 people per square kilometre, while in developing regions the average population density was 63.0 people per square kilometre and 23.9 people per square kilometre in developed regions (PDDESAUNS, 2007). In contrast to Russia, developing societies have already been facing, among other challenges, high rates of population growth and the resulting pressures on the natural environment and resources (El-Ghannam, 2002). From 2000 to 2005, the total population growth rate in

developing regions was 1.46% and 0.42% in developed regions, while during the same period the population growth rate in the Russian Federation was -0.48% (PDDESAUNS, 2007). Socially and economically, Russia is highly urban, industrial, and has the human capital and household structure found in developed regions (Kuhn and Stillman, 2004). For example, like developed regions where 72.0% of the total population is urban, 73.0% of the Russian population is urban. This is unlike developing regions where only 42.6% of the total population is urban (PDDESAUNS, 2007). It is because of these differences that Russia is fundamentally different ecologically, socially and economically from developing regions.

Russian society has taken an evolutionary path which has created a social and economic landscape that is also different from developed regions (Kollontai, 1999). As a result of its tsarist, and then communist past, society in Russia has historically been much less open than in other countries (Kollontai, 1999). An open society is synonymous with a civil society, and is based on the rule of law (Volobuev and Shelokhaev, 1999). Russia today is becoming more open however, and is going through a period of profound and condensed social transformation. In the process of modernization, Russian society is becoming more individualistic, stratified, and legally formalized (Kollontai, 1999). Unlike developed regions, however, Russia has poorly developed formal institutions of financial exchange, an underdeveloped market infrastructure, and a very limited social safety net (Kuhn and Stillman, 2004). Developed societies, on the other hand, are different from Russia in that they are the result of long historical processes of evolution of mutually reinforcing, gradual, mutations that have occurred in the various spheres of society and economics (Kollontai, 1999). In contrast to Russia, the slow process of development in developed countries has

allowed incremental social and economic changes to interweave in the fabric of society as a whole (Kollontai, 1999).

Because Russia is anomalous in many ways when compared to both developing and developed regions, the results of socioeconomic NTFP studies that have been conducted in these regions of the world cannot necessarily be applied to Russia. However, like people in both developing and developed regions, many of Russia's citizens are highly dependent on firewood, mushrooms, berries, herbs and other NTFPs (Nilsson and Shidenko, 1998). Researchers are now acknowledging that NTFPs are very diverse and that effects of their exploitation are location and product specific (Ros-Tonen and Wiersum, 2005). This study will contribute to filling a gap in the knowledge on non-timber forest product collection by examining the socioeconomic factors that affect NTFP collection in the Komi Republic, Russia.

The Komi Republic was chosen as a location for this study for two main reasons. First, the Komi Republic occupies 416 800 km^2 and accounts for approximately 2.4% of Russia's territory (FSDSKR, 2004). It has a well developed forest industry and a wealth of forest resources (Kozubov and Taskaev, 2000). Second, as a result of networking, logistical support for this study was available.

1.3 Research Objectives

In conducting this study in the Komi Republic, information will be added to the body of knowledge on the socioeconomic factors that affect NTFP collection in Russia.

Specifically, the objectives of the study were:

1. To assess the existing socioeconomic profile of the Komi Republic, Russia.
2. To determine how, in the Komi Republic, the collection of common NTFPs is affected by key socioeconomic factors. The specific factors being examined are: gender, age, educational level, occupational type, household size, income level and ethnicity. This objective will be achieved by either supporting or rejecting the following hypotheses (predictions):
    - Hypothesis 1: In the Komi Republic NTFP collection is affected by gender.
    - Hypothesis 2: In the Komi Republic NTFP collection is affected by age.
    - Hypothesis 3: In the Komi Republic NTFP collection is affected by educational level.
    - Hypothesis 4: In the Komi Republic NTFP collection is affected by occupational type.
    - Hypothesis 5: In the Komi Republic NTFP collection is affected by the household size.
    - Hypothesis 6: In the Komi Republic NTFP collection is affected by income level.
    - Hypothesis 7: In the Komi Republic NTFP collection is affected by ethnicity.
    - Hypothesis 8: In the Komi Republic women collect NTFPs for different reasons than men.
    - Hypothesis 9: In the Komi Republic women use NTFPs in the household differently than men.
3. To collect baseline data on the socioeconomic factors that affect NTFP collection in the Komi Republic so that they can be used by future resource developers and

forest managers to devise socially responsible resource policies, forest certification and development strategies (Doble and Emery, 2001).

4. To add to the body of knowledge about the general role of NTFP collection in rural livelihoods, in Russia.

This thesis used both qualitative and quantitative methods to examine some of the key socioeconomic factors that affect non-timber forest product collection in the Komi Republic, Russia. The qualitative methods included participant observation, focus groups and informal interviews. Content analysis was used to analyze the qualitative data. Quantitative data were collected using questionnaires and were then analyzed using descriptive statistics, contingency tables, chi-square, and logistic regression.

1.4 Thesis Outline

This thesis document is organized in the following way. Subsequent to this introductory chapter, Chapter Two is a more detailed review of the international literature that looks at the importance of NTFPs in rural livelihoods and the socioeconomic factors that affect NTFP collection. Chapter Three provides a physical description of the study area, as well as an overview of the socioeconomic situation in the Komi Republic. Chapter Four addresses both the qualitative and quantitative methods used in the study and discusses research opportunities and constraints. The results and discussion are presented in Chapter Five, while Chapter Six provides the conclusion and recommendations.

Chapter Two
Literature Review

2.1 The Socioeconomic Importance of Non-timber Forest Products

People have used non-timber forest products for millennia. From 1993 to 1994, the Food and Agriculture Organization (FAO) estimated that approximately 80% of the developing world's population used NTFPs to fill their primary health and nutritional needs (Egbule and Omolola, 2005). In India for example, in 2001, it was estimated that 50 million people live along the periphery of forests. Many of those people rely upon NTFPs such as fuel wood, charcoal, honey, resin, spices, and raw materials for handicrafts made from rattan, vines, bamboo, and grasses for both subsistence and cash income (Narendran et al., 2001). In addition to providing daily livelihood requirements, the sale of NTFPs can also provide a safety net during difficult economic times (Shaankar et al., 2004), particularly in places where other income assistance is either limited or not available.

Estimating the contribution that NTFPs make to people's livelihoods and household economies is difficult. This is due to the fact that NTFP harvesting is often seasonal, economic returns vary due to unpredictable market fluctuations and location, and access to the NTFP resource is not always reliable due to variability in the relative richness of natural resource stocks (Barham, 1999). Regardless of these difficulties, in many tropical, developing countries NTFPs supply the single most important livelihood contribution to poor people (Shaanker et. al., 2004). In India, for example, approximately 50 million people are believed to be directly dependent upon NTFPs for their subsistence (Shaanker, et al., 2004).

Pimentel et al. (1997) estimated that "upward of 300 million people in developing countries earn part or all of their livelihoods from forests."

People's reliance on the forest varies in different locations and NTFP gathering can often be a part-time and subsistence-oriented activity, which is combined with other livelihood pursuits (Ros-Tonen and Wiersum, 2005). Shackleton and Shackleton (2004) found that in South Africa, NTFPs are used by rural households both for subsistence, and to generate income. The sale of NTFPs is often a way for people to obtain additional money during difficult financial times (Arnold and Ruiz-Perez, 2001; Wunder, 2001). The vast majority of NTFPs, however, are consumed directly by the people who gather them, or are traded in small quantities (Belcher et al.2005).

Within the household, NTFPs are generally most extensively used to supplement diets during certain seasons throughout the year, and to help meet medicinal needs (Arnold and Ruiz-Perez, 2001). As such, NTFPs often function as a "natural insurance" (Pattanayak and Sills, 2001) or "safety net" (Ros-Tonen and Wiersum, 2005; Sunderlin, 2005). Although NTFPs are only one set of capital assets available to poor groups of people, they are used to improve people's standards of living (Ambrose-Oji, 2003). A general consensus shared by much of the literature is that poorer households use and benefit more from NTFP gathering than do the wealthier households (Arnold and Ruiz-Perez, 2001; Shackleton and Shackleton, 2004; Belcher et al.2005; Egbule and Omolola, 2005). Belcher et al. (2005) state that "there is strong evidence that under certain conditions the poor are disproportionately dependent on NTFPs."

There are many reasons NTFPs are attractive to gatherers – particularly to rural and generally poor people. These reasons include the ease of access to the forest which is often

common property or a public resource. Non-timber forest product harvesting in publicly accessible forests also requires low capital investment (Arnold and Ruiz-Perez, 2001). Because many poor people live in or close to forests, they generally do not need transportation or other equipment to engage in NTFP gathering. Since the skill thresholds for gathering are generally low (Arnold and Ruiz-Perez, 2001), everyone from children to the elderly members of households can participate. In addition, NTFPs generally do not require processing prior to sale (Belcher et al., 2005). Once gathered, NTFPs can either be used within the household or sold immediately without any sort of conversion (Arnold and Ruiz-Perez, 2001). Furthermore, NTFP gathering can be engaged in even by people who are geographically isolated, since it is most likely that they are nearer the forest resources (Ros-Tonen and Wiersum, 2005).

Another reason NTFP gathering is attractive is that it can be done as a complement to farming, mining or logging activities without jeopardizing formal employment arrangements. As a result, there is a growing tendency among forest-adjacent communities to seek a livelihood strategy which combines forest-based production with other farm and off-farm activities (Ros-Tonen and Wiersum, 2005).

While NTFPs are important to people for survival and livelihood purposes in developing countries, people in developed countries also collect NTFPs for a variety of reasons. There is growing interest in the role NTFPs play in the household livelihoods of people in developed regions. This interest is demonstrated by studies conducted in the United States (e.g., Carroll et al., 2003; Emery and O'Halek, 2001), Canada (e.g., Brigham et al., 2005), Scotland (e.g., Emery et al., 2006) and Finland (e.g., Saastamoinen et al., 2000).

In the United States, Emery and O'Halek, (2001) reviewed the historical use of NTFPs in the Pacific Northwest and Upper Midwest. Their study concluded, that NTFPs have continually been collected and used in the United States from prehistory to current times, by both indigenous and immigrant populations alike (Emery and O'Halek, 2001). The motivations for the collection and use of NTFPs in the United States are complex, and both indigenous and immigrant people collect for a variety of reasons. Carroll et al. (2003) studied NTFP gatherers motivations in northeast Washington State and northern Idaho, and divided gatherers into four main categories. "Native harvesters" (indigenous), who had strong cultural reasons for collecting NTFPs formed one category. "Non-native", household gatherers who collected NTFPs for their own use and to share with friends and relatives formed another category. "Income supplementers" formed a category of gatherer who collected NTFPs for household use, but also sold NTFPs as a means to supplement their incomes. The last category consisted of "full-timers" for whom picking, processing, and selling NTFPs was a full-time occupation during the appropriate season (Carroll et al., 2003).

Non-timber forest products research in Canada tends to focus on indigenous people and income generation, or economic development. For example, Brigham et al., (2005) conducted a study to assess the educational and training needs of first nations in the southern interior of British Columbia. The goal of their study was to enhance the ability of first nations people to participate in employment, and the creation of new businesses, in the non-timber forest products sector. Boxall et al. (2003) also looked at Canadian first nations and evaluated the market potential for wild berry jams produced by aboriginal communities. As a result of their study, Boxall et al. (2003) concluded that that markets for some first nations NTFPs appear to exist in Canada and may represent an income generating opportunity.

In Scotland, despite the process of industrialization and the loss of woodlands associated with World War I, Emery et al., (2006) found that the people continue to collect NTFPs. They reported that 24% of the Scottish population had collected 208 types of NTFPs from 173 vascular plant and fungal species, in the five years preceding 2003 (Emery et al., 2006). The NTFPs were used for household consumption, crafts, wine and other beverage making, and infrequently, medicinal uses. While the majority of the NTFP gatherers in Scotland collect for non-market purposes, some NTFPs are sold in the informal cash market, and are also commonly given as gifts (Emery et al., 2006). According to Emery et al., (2006), understanding the social, cultural, and economic significance of NTFP collection is fundamental to the development of forest policies and management strategies that are necessary to ensure the sustainability of NTFP collection in Scotland. The purpose of their study was to provide such an understanding (Emery et al., 2006).

The importance of NTFPs, particularly berries, in Finland is well understood and statistics on various aspects of berry collection exist (Saastamoinen et al., 2000). The study published by Saastamoinen et al. in 2000, updated the existing knowledge on the subject of berry collection and found that a total of 59.5% of Finnish households were engaged in collecting berries in 1997. The three most popular species collected were lingonberries (*Vaccinium vitis-idaea)*, bilberries (*Vaccinium myrtillus)*, and cloudberries (*Rubus chamaemorus),* and together constituted 90% of all the berries collected. Most of the berries collected were used within the household (72.7%), while the remainder (27.3%) were sold to generate cash income. A total of 4.8% of Finnish households participated in commercial berry picking in 1997.

These studies indicate that people in developed regions collect NTFPs for recreation (e.g., Anderson et al., 2003; Saastamoinen et al., 2000; Emery, 1999), to meet subsistence needs (Emery and Pierce, 2005; Carroll et al., 2003), for cultural reasons , to supplement incomes, and as a fulltime livelihood pursuit practiced during the appropriate seasons (Carroll et al., 2003; Saastamoinen et al., 2000). In addition to contributing to people's livelihood security, as in other regions of the world, NTFPs are also culturally important to gatherers in developed regions (Shackleton and Shackleton, 2004; Anderson et al., 2003; Turner and Cocksedge, 2001; Saastamoinen et al., 2000). Despite the necessity of collecting NTFPs, many gatherers in developed countries simply value the opportunity to "be close to nature", spend time with family members, and observe old traditions (Emery, 1999).

Hence, the picture that emerges from the literature is that some of the reasons people collect NTFPs are for subsistence, income generation, livelihood insurance, recreation, and cultural practices. Regardless of their reasons for collecting however, it is clear that wherever, and whenever, people have access to forests they gather and use NTFPs (McLain and Emery, 2001).

2.2 Socioeconomic Factors Affecting Non-timber Forest Product Gathering Across the World

There are many socioeconomic factors that have been found to affect NTFP gathering in various regions across the world. These factors affect who gathers, what, and why they gather. Some of the socioeconomic factors encountered in the NTFP literature are: gender (e.g., Bisong and Ajake, 2001; Emery 1999), age (e.g., Arnold and Ruiz-Perez, 2001;

Anderson et al., 2003), educational level (e.g., Egbule and Omolola, 2005; Anderson et al., 2003), occupational type (e.g., Bisong and Ajake, 2000; Anderson et al., 2003), household size (e.g., Quang and Anh, 2006; Svarrer and Olsen, 2005), income level (e.g., Godoy et al. 1995; Anderson et al., 2003), ethnicity (e.g., Narendran et al., 2001; Anderson et al., 2003), rural versus urban lifestyle, product prices, market demand, culture and tradition (e.g., Thoan, 2004), debt level, distance to forest (e.g., Gunatilake, 1998), and forest policy (e.g., Pandit and Thapa, 2003).

These factors may be universal, but this is difficult to determine with certainty since NTFP studies tend to be both product and location specific, making generalizations problematic (Ros-Tonen and Wiersum, 2005). Furthermore, the same factor can influence gathering in different regions, but may do so in opposing ways. For example, gender might affect firewood gathering but, in some regions women may be the primary firewood collectors, whereas in other areas, it may be the men who gather firewood. Gender, income level, and ethnicity are among the factors more commonly encountered in the NTFP literature, while the remaining factors listed above are encountered less often. The first seven factors (gender, age, educational level, occupational type, income level, household size and ethnicity), and how they affect NTFP collection in the Komi Republic, are the subject of this thesis.

In addition to references to these factors encountered in the NTFP literature, they were chosen because they help to describe the people who collect NTFPs, why they collect and what they do with what they collect. Each factor and its occurrence in the NTFP literature, is reviewed in more detail below.

2.2.1 Gender

Gender tends to be one of the more studied factors which affect NTFP gathering. It is also a factor that tends to vary widely in the way it affects gathering, depending on the geographical location of the study and the NTFP being collected. In the Western Ghats region of India, for example, women are the primary gatherers, users, and sellers of many NTFPs (Paloti and Hiremath, 2005). These NTFPs include fuel wood, food items, medicinal plants, forage, resins, dyes and fibres. In this instance, the women tend to do the gathering because, unlike men, they generally do not have alternative sources of employment (Paloti and Hiremath, 2005). In Sierra Leone, however, it is only men who, irrespective of employment status, participate in palm tree tapping. Cultural taboos prevent women from climbing the trees, thus excluding them from sap gathering activities (Lebbie and Guries, 2002).

Gender and the role of women in NTFP collection have been studied in many regions of the world. For example, Bisong and Ajake (2000) wrote that Sarin (1995) and the Tropical Forest Action Plan of 1990 confirmed fuel wood as the main source of livelihood for the rural women in south-west Bengal. They went on to cite that in Addis Ababa, Rodda (1991) estimated that 73,000 women and children were involved in the collection and sales of fuel wood in the cities. The Yoruba women of south-western Nigeria, on the other hand, supplement their formal employment earnings with money they make through the processing of palm oil (Cashman, 1987 in Bisong and Ajake, 2000). In south-eastern Nigeria, processing and marketing of some non-timber forest products such as kola nuts, chewing sticks, bush mangoes and palm oil are dominated by rural women who are using NTFPs as a

means of earning income (Bisong and Ajake, 2000). Egbule and Omolola (2005) had similar findings and noted that in southern Nigeria, in general, it is the women and girls who collect NTFPs. In the cases listed above it is the females who participate in gathering activities, therefore, supporting the idea that gender is an important factor in determining who collects NTFPs.

Gender is also a factor that affects collection in other regions where some NTFPs are gathered by women and others are gathered by men. In South Africa, women are the primary producers and traders of products such as brushes and marula beer while men are the ones who are involved in selling fuel wood (Shackleton and Shackleton, 2004). Although female family members do help the men with the finishing of wood carvings, in preparation for the marketplace, the production of the carvings themselves is the men's job. This observation suggests that in this region women tend to trade in non-wood forest products while men are more involved with wood-based NTFPs (Shackleton and Shackleton, 2004).

Various studies have found that NTFP gathering is affected by gender to varying degrees. Women and men collect NTFPs for different reasons, and use the products in different ways. In a study which took place in south-eastern Nigeria, Bisong and Ajake (2001) discovered that there is a high level of women's involvement in NTFP gathering due to the ease of collection, processing and accessibility. In Sri Lanka, however, Gunatilake (1998) found that although the forest activities conducted by men and women were different (i.e., strenuous vs. non-strenuous), there was no statistical difference in overall forest dependency between the genders. In Cameroon, the gathering and marketing of NTFPs is done mainly by women and children (Ndoye and Tieguhong, 2004). For example, in some

regions of Cameroon, it is estimated that 94% of the NTFP traders are females (Ndoye et al., 1997 in Ndoye and Tieguhong, 2004).

Gender is also a factor in NTFP gathering in developed nations however it is a factor that has not been well studied there. Emery (1999) found that in the Upper Peninsula of Michigan in the U. S., women mentioned 40% more non-market uses for NTFPs than did the men. Although it is clear that gender affects NTFP collection, it is also apparent that it does so differently depending on the geographical location and culture of the people collecting.

2.2.2 Age

The age of NTFP gatherers is a factor which is frequently mentioned in the literature and affects patterns of NTFP use within the household (Arnold and Perez, 2001). For example, Egbule and Omolola (2005) found that the majority of NTFP gatherers in southern Nigeria, were middle-aged women, 41-50 years old. In Nameri National Park, Assam, India, on the other hand, the majority of firewood collectors were between the ages of 16 and 30 years old (Chetry et al., 2003), while in Sierra Leone, palm tapping is done by men under the age of 40 (Lebbie and Guries, 2002). While the NTFPs being collected and locations vary, so do the age groups to which the collectors belong.

Pattanayak and Sills (2001) reported on the role of age as a factor affecting NTFP collection at that household level. Their study indicated that in the Brazilian Amazon, households that, as a whole, had a younger average age rely less on the forest than do households that have an older average age. Researchers discovered that it was the members of older households – with the exception of the very oldest – who made the most trips to the

forest in search of NTFPs. They suggested that this could be due to the level of accumulated forest knowledge held by the households with an older average age, or alternatively, a result of households with a younger average age being more willing to embrace commercial substitutes for NTFPs (Pattanayak and Sills, 2001).

Age was also a factor that affected NTFP collection in developed nations such as the United States. Anderson et al. (2000) reported that the average age of NTFP gatherers in the San Bernardino National Forest in the United States varied according to the ethnic group to which they belonged. For example 70% of the Japanese respondents in the San Bernardino National Forest indicated that the middle generation, aged 26-59 years old, was most interested in gathering, while only 61.9% of the Koreans indicated this age group and placed more emphasis on the 60-year-plus age group (Anderson et al., 2000). Although the types of age related data collected sometimes differ (individual vs. household data), age has been shown to be a factor that affects NTFP collection.

2.2.3 Educational Level

Educational level has been shown to be a factor which affects NTFP collection in various regions. Egbule and Omolola (2005) found that NTFP gatherers in southern Nigeria were primarily women with low levels of education. Of the forest operators surveyed, 73.6% of them reported primary school as their highest level of education. Of these respondents, 31.9% reported that they had no formal education at all (Egbule and Omolola, 2005). Lebbie and Guries (2002) found that palm tree tappers in Sierra Leone are illiterate, and only four of the 21 tappers they surveyed had even a primary school education. In Sri Lanka, Gunatilake

(1998) also reported that as educational level increased, dependency on NTFPs decreased. This is not always the case however, since in South Africa, 18% of marula beer producers were educated, which suggests that it was the lack of employment opportunities rather than low educational levels that caused these gatherers to sell NTFPs (Shackleton and Shackleton, 2004).

In developed regions, such as the San Bernardino National Forest in the U. S., it was found that edible fern collectors had higher than average educational levels with 76.5% of them having education beyond high school (Anderson et al., 2000). These studies demonstrate that the relationship between educational levels and NTFP collection can not be generalized, and should be evaluated on a case by case basis.

2.2.4 Occupational Type

Occupational type is a socioeconomic factor that can affect NTFP collection for several reasons. First, occupation can often indicate the income level of a person or household; and second, it can dictate the time available for collection activities. Those who do not have access to other types of employment can devote all of their time to NTFP gathering and in many cases need to do so in order to survive. In various developing nations, NTFP gathering is the main subsistence activity and is practiced fulltime by tribal and other rural people (Tewari, 2001).

Based on the literature, agriculture is a common occupation among NTFP gatherers in places like south-eastern Nigeria (Bisong and Ajake, 2000), southern Cameroon (Brown and Lapuyade, 2001), the Brazilian Amazon (Pattanayak and Sills, 2001) and Sri Lanka

(Gopalakrishnan et al., 2005). In the Peruvian Amazon, people make their living using a mix of swidden fallow agroforestry, fishing and hunting (Coomes, 2004). Agriculture is not always the primary occupation of NTFP gatherers. While in many parts of the world NTFP harvesters are otherwise employed in agriculture, in the Niligri Biosphere Reserve in southern India, agriculturalists and wage earners are less dependent on NTFPs than landless and indigenous communities (Narendran et al., 2001). Among the non-tribal agriculturalists the contribution by NTFPs to the per capita household income had a mean of 30%, whereas among the tribal people the NTFP contribution had a mean of 57% (Narendran et al., 2001).

Some of the other occupations NTFP gatherers in developing regions, such as south-eastern Nigeria, participate in, include farming, sewing, trading, teaching, healthcare, and the civil service (Bisong and Ajake, 2000). As a result of participating in these occupations, people find NTFP collection, and subsequent handcrafting, an attractive supplementary occupation because, among other reasons, it can easily be fitted into their workday (Coomes, 2004). These examples demonstrate that in various locations, people from a variety of occupational backgrounds rely on gathering NTFPs for both subsistence and as a social safety net during times of hardship (Sunderlin, 2005).

Non-timber forest product gatherers in developed regions also have a variety of occupational backgrounds. Some are even fulltime NTFP gatherers as was reported by Carroll et al., (2003) in the United States. However, unlike gatherers in developing regions, in northwest Washington State and northern Idaho, it is often retirees and people on social assistance, rather than agricultural workers, who gather NTFPs fulltime or to supplement their incomes (Carroll et al., 2003). Gatherers in Scotland also have a variety of occupational backgrounds as was demonstrated by Emery et al. (2006). They found that people with

professional, managerial and technical occupations, were more likely to collect NTFPs than people who were in partly skilled and unskilled occupations. They also found that people who worked part-time (42%) were more active NTFP gatherers than those who worked fulltime (20%) or were unemployed (20%) (Emery et al., 2006). These studies show that NTFP gatherers come from different occupational backgrounds and that the occupations held by people in developed regions are different than those held by people in developing regions.

2.2.5 Household Size

The size of a household can influence NTFP gathering in two ways: it can increase the need for more NTFPs to be collected and it could increase the number of people available to do the gathering. In Vietnam, for example, households in the village Que were larger (5.8 members/household) and earned more money collecting NTFPs than smaller households in the village Ma (4.6 members/household) (Quang and Anh, 2006). The households in Que also sold more of the NTFPs they collected, whereas the households in Ma collected more NTFPs for household consumption, than for sale. In contrast to the findings of Quang and Anh (2006), however, household size was not a factor in NTFP collection in the Brazilian Amazon state of Rondonia in the case study conducted by Summers et al. in 2004. In that study, the number of working household members, dependents, and off-farm workers was not found to affect NTFP extraction (Summers et al., 2004). Household size can also be used as a variable in models designed to predict NTFP extraction levels of a household (Svarrer and Olsen, 2005). This was done by Svarrer and Olsen (2005) in the Jah Hut, in the Kuru Wildlife Reserve, Peninsular Malaysia. They found that the average household size was 2.6

members, based only on individuals who could realistically be expected to participate in gathering activities, then combined it with other variable in their model (Svarrer and Olsen, 2005). Understanding the relationship between household size and NTFP collection could contribute to a better understanding of people-forest interaction (Gopalakrishnan et al., 2005).

Household size is a factor that was not reported on in the NTFP literature from developed regions.

2.2.6 Income Level

Like gender, income level is one of the more commonly discussed socioeconomic factors which affects NTFP gathering. Many studies state that it is the poor and disadvantaged who rely most heavily on NTFPs for survival (Arnold and Ruiz-Perez, 2001). It is generally believed that people gather NTFPs because they need to generate cash income, lack alternative income-earning opportunities, and need to find inexpensive substitutes for necessary goods in order to reduce household expenditures (Shackleton and Shackleton, 2004). The option to gather free forest resources and convert them into subsistence and income generating NTFPs provides a necessary safety net for many households (Shackleton and Shackleton, 2004). In the Kat River area of the Eastern Cape, South Africa, more low income households (>30%) were found to engage in the sale of NTFPs for cash generation than the wealthy households of which only <10% engaged in the sale of NTFPs (Shackleton and Shackleton, 2004).

It is generally understood, that in developing regions, NTFPs are important to people with low income levels. However, as a factor, a low income level does not always indicate more inclination to gather NTFPs. Belcher et al. (2005) found that in 44% of the cases they studied, the NTFP producer households had incomes that approached or exceeded the national average. This could be because wealthier people are generally better placed to take advantage of new market opportunities, have land and/or capital to invest in NTFP gathering activities, and have better skills and connections (Arnold and Ruiz-Perez, 2001; Belcher et al., 2005). As a result, while NTFPs may be important to low income people, they may not always be the ones who are the most active gatherers. The role of a particular NTFP in the livelihood strategy of a household varies according to circumstances and opportunities of that household (Belcher et al.2005) and it may not always be the lowest income households that are most dependent on NTFPs (Arnold and Ruiz-Perez, 2001).

In developed regions, NTFP gatherers with higher income levels are often the most active gatherers. This was demonstrated by Anderson et al. (2003) who found that fern gatherers in the San Bernardino National Forest had moderate income levels. These results, however contradicted the findings of an earlier study conducted by Richards and Creasy, (1996) who found that NTFP gatherers had lower than average income levels (Anderson et al., 2003). As in developing regions, the effect of income level on NTFP collection varies depending particulars of the case being studied.

2.2.7 Ethnicity

Ethnicity is a factor that has been shown to affect NTFP gathering. In Cameroon, for example, minority ethnic groups have been found to do much of the commercial NTFP gathering (Ndoye and Tieguhong, 2004). Narendran et al. (2001) also found that ethnicity plays an important role in NTFP gathering. Kurumba, Irula, Kotha, Paniya, and Cholanayaka ethnic groups were found to be more active in NTFP gathering than the Toda ethnic group. In general, NTFPs contribute 12% of the household income in the Nilgiri Biosphere Reserve (NBR). In comparison, in the case of Kurumba, Irula, Kotha, Paniya, and Cholanayaka ethnic communities in the NBR, the proportion of income generated by NTFP gathering is 57% (Narendran et al., 2001). In Sierra Leone, the Limbas ethnic group dominates palm wine production because it is believed to have more skilful palm tappers than other ethnic groups (Lebbie and Guries, 2002). In southern India, Shaankar et al., (2003) found that dependence on NTFPs was significantly affected by the ethnicity of the people collecting. Their study indicated that ethnic Soligas derived a greater proportion of their total income from NTFPs than ethnic Lingayats (Shaankar et al., 2003). These studies indicate that ethnicity plays a role in NTFP collection in developing regions.

Ethnicity also affects NTFP collection in developed regions. In the United States, for example, Anderson et al. (2000) studied the role of ethnicity in fern gathering in the San Bernadino National Forest and found that there were differences in attitudes towards NTFP collection between ethnic Japanese and ethnic Korean respondents. These differences included the role of age as a factor in gathering; categorization of collection as "work" versus "fun"; the sharing of harvested ferns with friends and family inside versus outside the United

States; perspective on fees charged for collection permits; and the use of ferns in holiday cooking (Anderson et al., 2000). These results led to the conclusion that the NTFP gathering activities of these two distinct ethnic groups are affected by the factor of ethnicity, rather than race (Anderson et al., 2000).

The ethnicity of NTFP gatherers is a factor that can affect what people collect, why they collect and what they do with what they collect. There is but a limited number of studies, however, that acknowledge the cultural value of NTFP collection (Anderson et al., 2000).

2.3 Summary

There are many socioeconomic factors that affect NTFP gathering. Some factors are universal, well studied, and explicitly documented (gender, income level), while others are more implicit and obscure (age, educational level, occupational type, household size, ethnicity). Regardless, all factors are heavily influenced by the geographic location and specific NTFP being studied (Ros-Tonen and Wiersum, 2005). This means that while factors that describe gatherers are important in predicting or describing NTFP collection activities, there are limitations to how such information can be interpreted and generalized outside of the geographical area in which the study was conducted.

Chapter Three
Description of the Study Area

3.1 Physical Description of the Komi Republic

The Komi Republic is located between 59° 12' and 68°25' latitude and between 45°25' and 66° 10' longitude. It has an area of 415,900 km^2 which amounts to approximately 2.44% of the total area of the Russian Federation. The capital city of the Komi Republic is Syktyvkar which is located 1515 km northeast of Moscow (Strogov et al., 2004) and has an approximate population of 246,200 (Strogov et al., 2004). (See Figures 1 and 2).

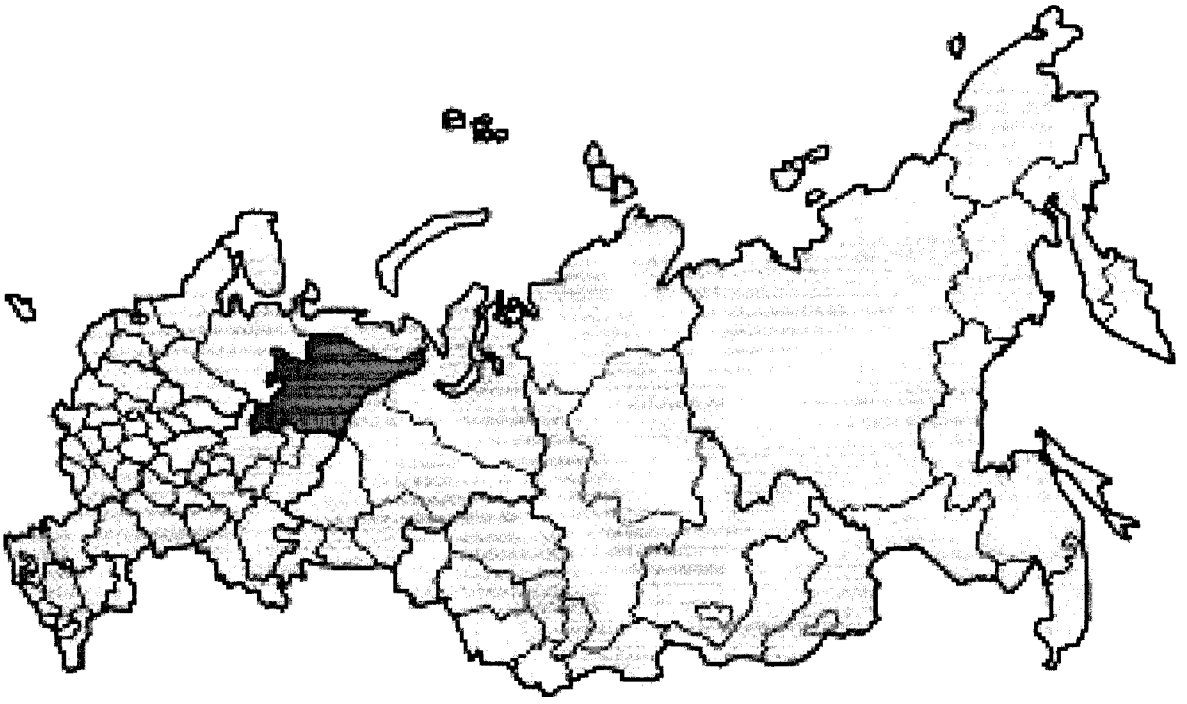


Figure 1. General location of the Komi Republic in the Russian Federation.

(Source: http://www.russiatrek.com/rp_komi.shtml)

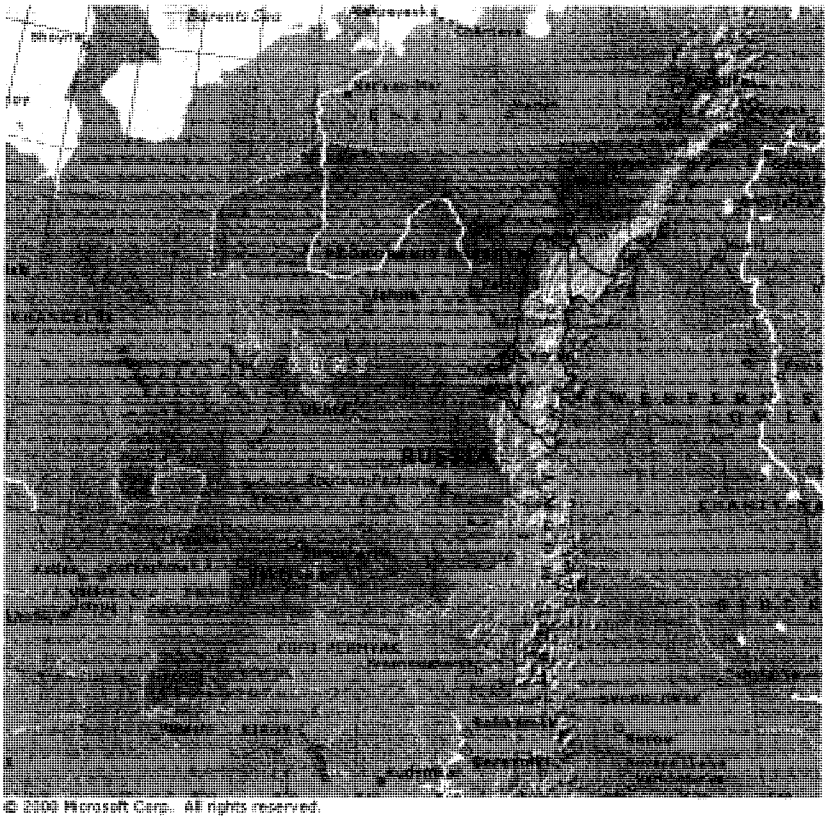


Figure 2. Map of Komi Republic.

(Source: http://odur.let.rug.nl/~bergmann/russia/regions/rus11ko.htm)

The Komi Republic is divided into 20 administrative regions. Of these regions, eight (labelled 1 to 8 on Figure 3) are administered by the municipal governments of their capitals, while the remaining 12 (labelled 9 to 20 on Figure 3) are administrated by regional governments (Strogov et al., 2004). Figure 3 shows the location of the regions and their capitals. Figures 12 to 16 in section 4.0.2 (Village Selection) provide detailed maps of the administrative regions which contain the study villages.

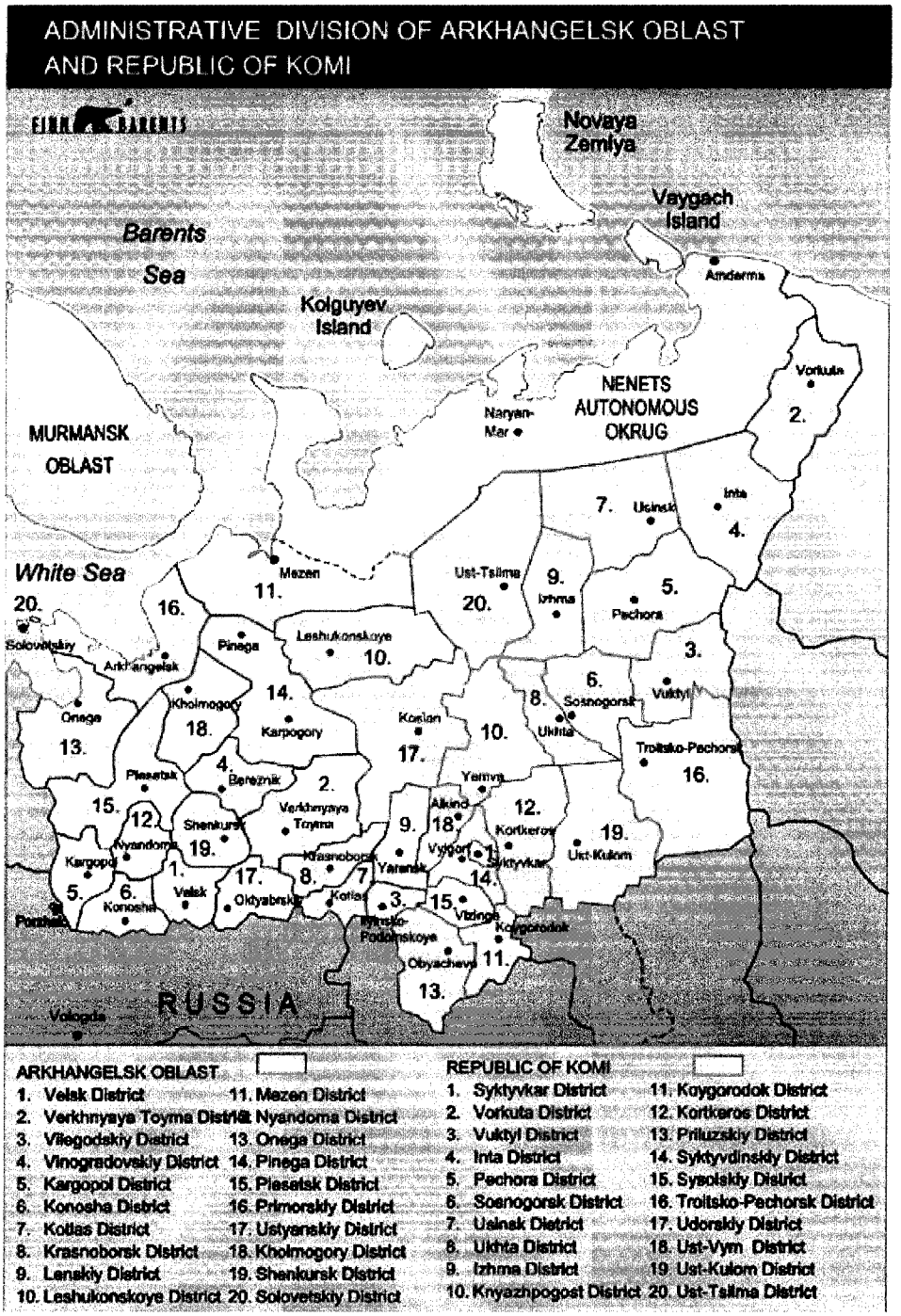


Figure 3. Administrative regions (labelled as "districts") of the Komi Republic and their capital cities (Source: http://www.barents.fi/images/20040213153046.jpg).

3.2 Ecology of the Komi Republic

Non-timber forest products are natural resources therefore, their diversity and abundance in an area depend on the ecosystems in which they are found. In general, approximately 72.7% of the Komi Republic is covered by forests and brush; 9.8% by wetlands; 9.5% by treeless tundra; 1.5% by water bodies; 1.1% by farmland; and 5.7% by land with other miscellaneous designations (Savel'eva, 1997). According to Russian ecosystem classification, forests are classified based on whether they are "light" coniferous, "dark" coniferous or deciduous. The dominant tree species in light coniferous forests are pine and larch. In dark coniferous forests, the dominant tree species are spruce, kedr (*Pinus sibirica*), and fir. The composition of Komi forests according to leading tree species is listed in Table 1.

Table 1. Species composition of Komi forests.

Species	Percent Composition
Spruce (*Picea obovata* and *P. abies*)	59.7
Pine (*Pinus sylvestris*)	23.0
Birch (*Betula pubescens*, *B. pendula*, *B. tortuosa*)	12.2
Aspen (*Populus tremula*)	3.4
Fir (*Abies sibirica*)	0.7
Larch (*Larix sibirica*)	0.8
Kedr* (*Pinus sibirica*)	0.1
Other	0.1

*Kedr is the common name for *Pinus sibirica* in Russia. (Bobkova et al., 2000)

The understory vegetation cover is as equally important to NTFP production as the overstory composition. A listing of the common NTFP plants and fungi which are collected in the Komi Republic can be found in Appendix 1. The map in Figure 4 depicts the forest cover in the Komi Republic.

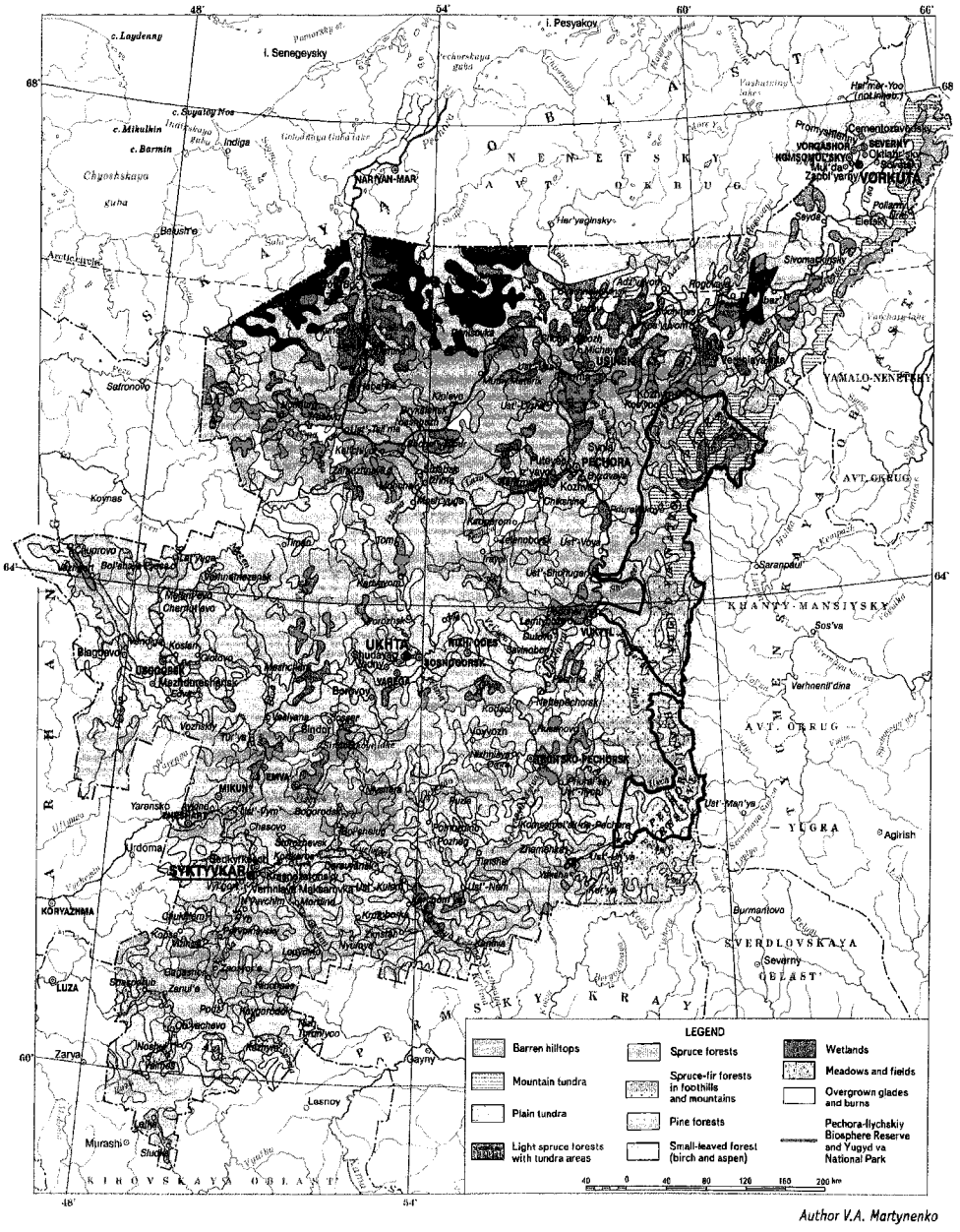


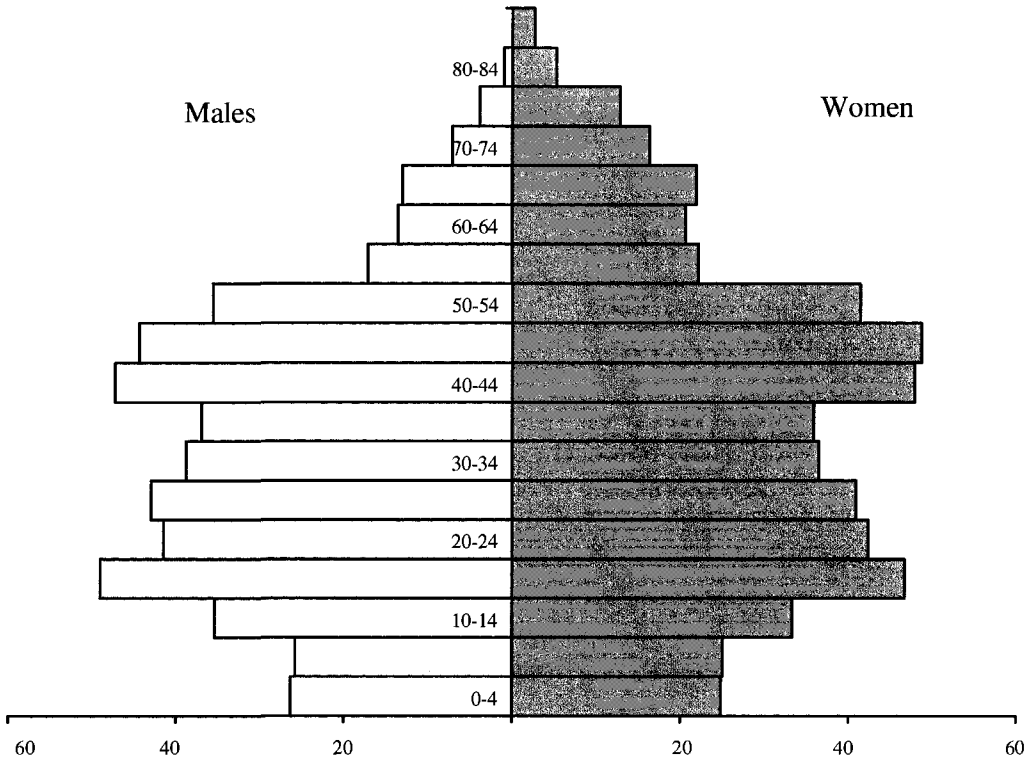
Figure 4. Forest cover map of the Komi Republic (Martynenko, 2006).

3.3 Demographics

The inhabitants of the Komi Republic come from over 70 ethnic groups but the majority are either native Komi (~25%), or Russian (~58%) (Savel'eva, 1997). The population of the Republic was 997 006 people on December 1, 2004 which is 8700 people less than it was on January 1, 2004. Three reasons for a continuing decline in population are cited in the 2005 census document. These are: that the mortality rate is surpassing the birth rate; there has been a decrease in the number of marriage and subsequent child births; and the most significant reason cited is the continued migration out of the Republic (Bazhenova, 2005).

3.4 Gender and Age

At the beginning of 2004, there were 525 007 women and 480 699 men living in the Komi Republic. Expressed as a ratio, there were 1092 women for every 1000 men. This represented an increase in the proportion of women to men which was 1087 women to 1000 men at the same time the previous year. However, the ratio of women to men remained unchanged in the under 40 year-old category. But in the 50 year-old plus category there were 55.8% more women than men. The disproportion of women to men is particularly dramatic in the 60 year-old plus age category. At the beginning of 2004, the number of women surpassed that of men in this age category by twofold (Bazhenova, 2005). Figure 5 shows the summary of age distribution by gender.



(Bazhenova, 2005)

Figure 5. Number (thousands) of males and females by age group.

3.5 Education

The UNDP Human Development Report 2006 indicated that the literacy rate in Russia for citizens over age 15 was 99.4% in 2004 (UNDP, 2006). This high literacy rate can be attributed to the Russian education system. The system is structured such that students attend compulsory basic education beginning at age 6 and ending at age 15. After these first nine years, students have what is called "nepolnoe srednie obshchee obrozovanie" or incomplete high school education. At this point students can continue on with high school and receive an "Attestat o Srednem (Polnom) Obshchem Obrazovanii", which is the equivalent of a complete high school diploma in Canada. After finishing the ninth grade,

students can also chose to enter a non-university vocational or technical institution of higher education. At this point they can concurrently complete their high school education while receiving professional training or receive vocational training alone. However, if students wish to enter university they must have a complete high school education regardless of the stream they follow to obtain it.

3.6 Occupation

The 2004 census of the Komi Republic lists the following occupational sectors: industry, agriculture, transportation, communications, construction, retail trade, housing, health, education, art and culture, finance, and administration. Figures 6 to 11 give visual summaries of the proportions of people occupied in each sector in 2003 for the entire republic, as well as for each of the five study regions individually.

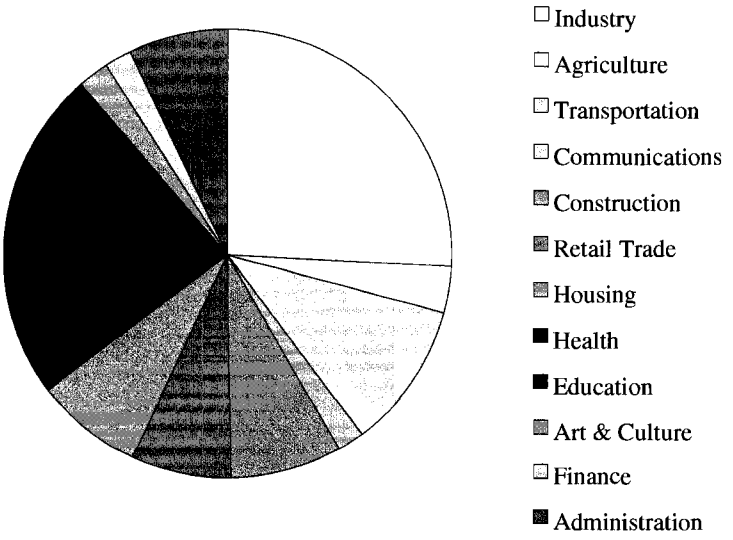


Figure 6. Proportion of workers by sector in the Komi Republic (FSDSKR, 2004).

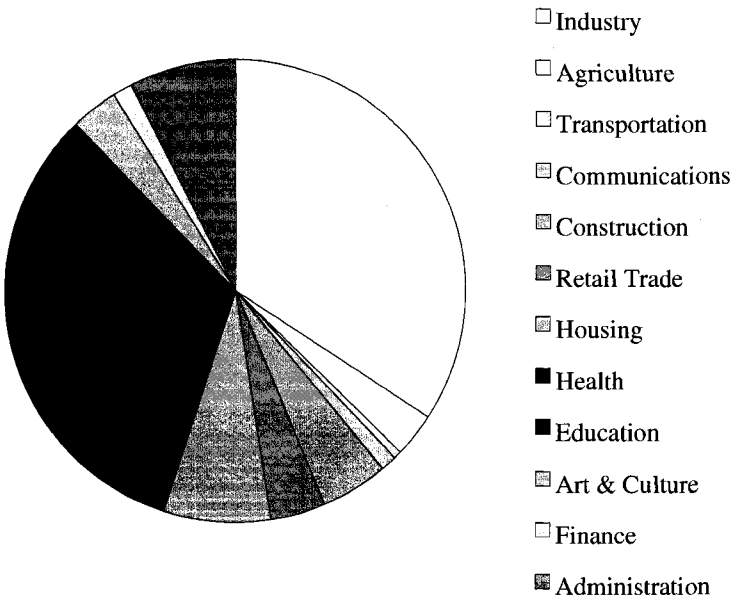


Figure 7. Proportion of workers by sector in the Koigorodskii Region (FSDSKR, 2004).

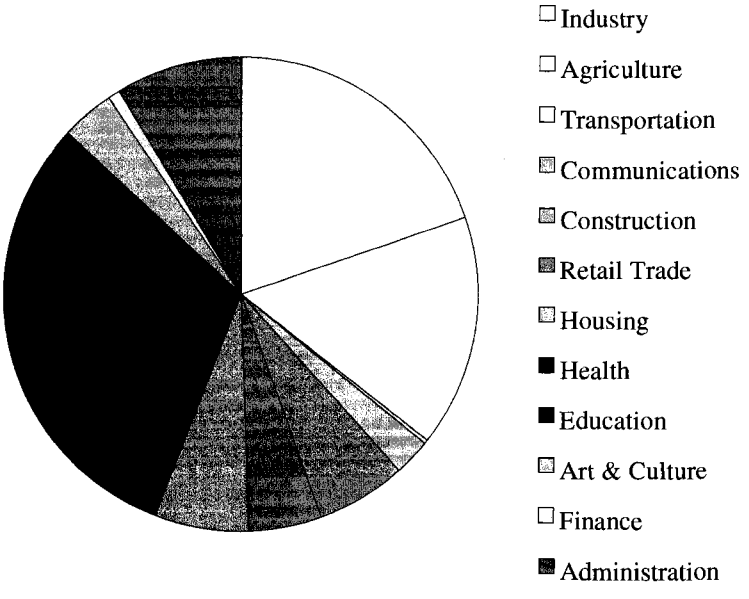


Figure 8. Proportion of workers by sector in the Kortkerosskii Region (FSDSKR, 2004).

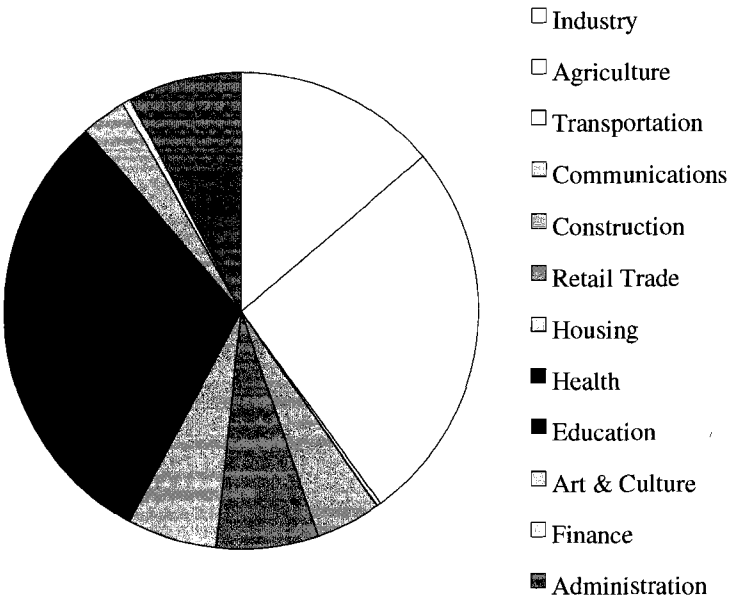


Figure 9. Proportion of workers by sector in the Syktyvdinskii Region (FSDSKR, 2004).

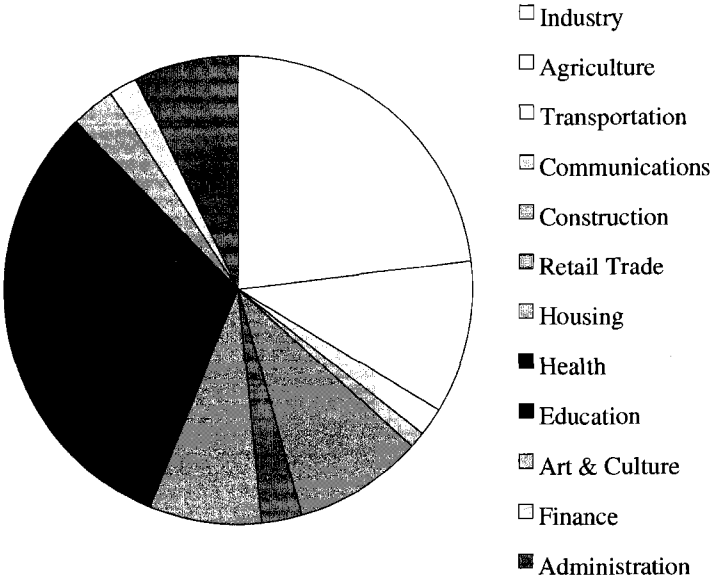


Figure 10. Proportion of workers by sector in the Sysol'skii Region (FSDSKR, 2004).

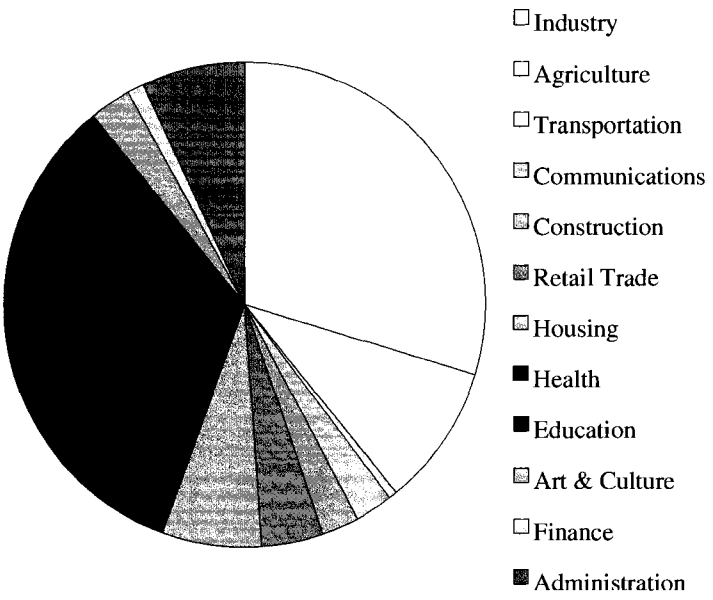


Figure 11. Proportion of workers by sector in the Ust'Kulomskii Region (FSDSKR, 2004).

3.7 Household Size

There were a total of 294 679 private households, excluding institutions, in the Komi Republic in 2002. The total number of people living in private households was 905 665. This means that the average household size was approximately three people per household. More precisely, there were 104 533 two-person households representing 35.5% of the households; 100 406 people living in three-person households which is another 34.1%; 64 357 people in four-person households (21.8%); and 25 383 people living in households with five or more people (8.6%) (FSDSKR, 2005).

Of the total number of private households in the Republic, 70 310, or 23.9%, were rural. In comparison to the overall averages for the Republic, 24 907 (35.4%) of rural households had two people; 21 392 (30.4%) had three people; 15 900 (22.6%) had four

people; and 8111 (11.5%) had five or more people (FSDSKR, 2005). Hence, compared to the averages for the entire Republic, rural areas had the same number of two- and four-person households, fewer three-person households and more households with five or more people (See Table 2 for a summary).

Table 2. The number of people in rural households compared to the entire Republic.

	Number of Households	Total Population	Households consisting of: 2	3	4	>5	Average number of people within each household
Republic Total	294679	905665	35.5	34.1	21.8	8.6	3.1
Rural Population	70310	221821	35.4	30.4	22.6	11.5	3.2

(FSDSKR, 2005)

Average household sizes and proportions also vary slightly depending on the region. Table 3 summarizes the 2002 data by region and identifies to which region each study village belongs.

Table 3. Number of people in each household by region.

Region (Raion)	Total # of households	Total # of people living in private households	% Households consisting of: 1	2	3	4	>5	Avg. # of people in ea. household
Koigorodskii	3893	9961	23.6	29.5	23.7	16.5	6.8	2.6
Kortkerosskii	8854	23555	22.6	27.7	23.6	17.4	8.8	2.7
Syktyvdinskii	8944	24010	22.3	26.5	24.4	17.8	9.0	2.7
Sysol'skii	6487	16516	26.7	26.7	22.9	16.2	7.5	2.5
Ust'-Kulomskii	11370	31903	19.5	25.5	25.2	19.6	10.2	2.8

(FSDSKR, 2005)

3.8 Income

Table 4 indicates that 0.7% of the population of the Komi Republic earns less than 1000 roubles per month, 13.1% earn between 1000 and 3000 roubles/month, 27.1% earn 30000-6000 roubles/month and 59.1% of the population earns more than 6000 roubles per month (FSDSKR, 2004). However, these numbers merely reflect the overall averages for the Republic, include both urban and rural populations and do not take into account regional economic differences. While Table 4 presents the wage statistics for the Republic as a whole, Table 5 provides average monthly wages by region. From Table 5, it is clear that while the average monthly wage for the Komi Republic is 7884 roubles, in the Koigorodskii Region it is 4464 roubles; in the Kortkerosskii Region it is 3916; in the Syktyvdinskii Region it is 4490; in the Sysol'skii Region it is 4076; and in the Ust'-Kulomskii Region the average monthly wage is 3710 roubles (FSDSKR, 2004). All of these averages are significantly less than that of the entire Republic as a whole. For reference, in 2005 one Canadian dollar equalled approximately 22 Russian roubles. Therefore, 1000 roubles equal approximately 45 Canadian dollars and 17 000 roubles equal approximately 773 Canadian dollars.

Table 4. Average income in the Komi Republic in 2005.

Wages in Roubles/Month	Thousands of People	Percentage of Population
Total	996.4	100
Up to 1000	7.2	0.7
1000 – 2000	48.8	4.9
2000 – 3000	82.2	8.2
3000 – 4000	93.5	9.4
4000 – 5000	91.9	9.2
5000 – 6000	84.4	8.5
6000 – 7000	75.0	7.5
7000 – 8000	65.5	6.6
8000 – 9000	56.7	5.7
9000 – 10 000	48.9	4.9
10 000 – 11 000	42.1	4.2
11 000 – 12 000	36.2	3.6
12 000 – 13 000	31.3	3.1
13 000 – 14 000	27.0	2.7
14 000 – 15 000	23.4	2.4
15 000 – 16 000	20.3	2.0
16 000 – 17 000	17.7	1.8

(FSDSKR, 2004)

Note: In 2005, 1 Russian rouble ~ 0.045 of a Canadian dollar or 1 Canadian dollar ~ 22 Russian roubles.

Table 5. Average wages by region (including both urban and rural settlements).

Region (Raion)	Average Wage (Rubles/Month)
Komi Republic (total)	7884
Regions administered by their capital city:	
Syktyvkar	6943
Vorkuta	8859
Vuktyl	10095
Inta	6911
Pechora	8676
Sosnogorsk	8440
Usinsk	14793
Ukhta	10198
Other regions:	
Izhmskii	3476
Kniazhpogostskii	5607
Koigorodskii	4463
Kortkeroskii	3916
Priluzskii	4081
Syktyvdinskii	4490
Sysolskii	4076
Troitsko-Pechorskii	4252
Udorskii	4367
Ust'-Vymskii	5895
Ust'-Kulomskii	3710
Ust'-Tsilemskii	4109

(FSDSKR, 2004)

Note: In 2005, 1 Russian rouble ~ 0.045 of a Canadian dollar or 1 Canadian dollar ~ 22 Russian roubles.

3.9 Summary

The Komi Republic, like the rest of Russia, is unique in comparison to both developing and developed regions of the world. The following is a summary of the socioeconomic characteristics of the Komi Republic and how they compare to developing and developed regions.

The Komi Republic has a low population density with approximately 2.2 people per square kilometre, unlike the average 2005 population density in developing regions, which was approximately 63.0 people per square kilometre, or developed regions that had approximately 23.9 people per square kilometre (PDDESAUNS, 2007).

The life expectancy of males in the Komi Republic is substantially lower than that of females, as reflected in the disproportionate ratio of males to females, particularly in the 60 year-old plus age category (Figure 5). In Russia in general, the life expectancy of males for the period from 2000 to 2005 was 58.5 years which was lower than the average life expectancy of males in developing regions, which was 64.0 for the same period (PDDESAUNS, 2007). However, the life expectancy of females in Russia was 71.8 years and closer to the life expectancy of females in developed regions, which was 78.3 years from 2000 to 2005 (PDDESAUNS, 2007).

People in the Komi Republic, and Russia in general, have an average of 13 years of education. In comparison, people in developed countries such as Canada and France have an average of 16 years of education, and people in developing countries such as India and Cameroon have 9 and 10 years of education respectively (UNESCO, 2006).

In the Komi Republic, approximately 3% of the labour force worked in agriculture in 2004 (FSDSKR, 2004), whereas in Russia overall, that figure was 9.4%. In comparison, 6.4% of the labour force in developed regions, and 53.0% of the labour force in developing regions worked in agriculture in 2004 (FAO, 2006b).

The average household size in the Komi Republic was approximately 3.1 in 2005 (FSDSKR, 2005), while in developing regions household sizes vary from 5.6 to 4.8 people (Bongaarts, 2001) and in Canada, in 2006, the average number of people was 2.5 (Statistics Canada, 2006). This is an approximate comparison of household sizes, because data for the same reference year was not available.

Finally, the average annual income in the Komi Republic was approximately $3000.00 U.S. dollars in 2005, while the average annual income in Canada was approximately $32,724 U.S. dollars and $3407 in India (UNDP, 2007). The factors summarized above illustrate the similarities and differences of Russia to both developing and developed regions.

Russia is a large, culturally and biophysically diverse country. The Komi Republic was chosen as the location for this study for several reasons. First, the Komi Republic is a region of Russia that has a well developed forestry sector and is known for its wealth of both timber and non-timber forest resources (Kozubov, 2000).

Second, the Komi Republic was chosen for logistical reasons. Because of its history, Russia continues to be less open than other countries (Kollontai, 1999) making it difficult for an independent foreigner to travel and conduct research there. In the case of this thesis however, these challenges were overcome through international networking and the help of both Canadian and Komi academics with ties in the Komi Republic.

Chapter Four
Methods

4.1 Introduction

This study had a multimethod design and was conducted using both quantitative and qualitative methodologies (Morse, 2003). As Johnson and Turner (2003, pg. 299) state: "in many cases, the mixing of qualitative and quantitative methods will result in the most accurate and complete depiction of the phenomenon under investigation (Johnson, 1995; Johnson & Christensen, 2000; Patton, 1990; Tashakkori & Teddlie, 1998)."

While quantitative and qualitative methods were used concurrently, the quantitative methods formed the basis of the project (Morse, 2003). Qualitative methods were then used to elicit information that the quantitative methods alone could not achieve. In applying this multimethod design, the individual methods were kept intact so that the results of each method could be triangulated, or compared to each other, to achieve the objectives of the study (Morse, 2003).

By combining a quantitative survey (questionnaire), with qualitative methods such as participant observation, focus groups and informal interviews, the subsequent analyses enabled a deeper interpretation of the results. The quantitative method (questionnaire) yielded numerical data, while the qualitative methods (participant observation, focus groups, informal interviews) elicited information that provided context and a greater explanation of the numbers generated by the questionnaire. In combination, this methodological approach achieved the following objectives: assessed the existing socioeconomic profile of the Komi Republic; tested eight hypotheses to assess how key socioeconomic factors affect the

collection of common NTFPs; collected baseline data on the socioeconomic factors that affect NTFP collection in the Komi Republic; and added to the body of knowledge about NTFP collection in Russia.

4.1.1 Preparations and Orientation Period Upon Arrival in the Komi Republic

As mentioned in Chapters 1 and 3, the Komi Republic was chosen as a location for this study because forestry is well developed in this region of Russia (Kozubov, 2000). Before departing for the Komi Republic, networking was done to obtain contact information and to secure accommodations for the starting point of the project. In Canada, there is little information about the Komi Republic, and with the exception of what several websites provided, much of the background information necessary for detailed planning was not available. As a result, many of the fieldwork logistics were dealt with upon arrival in the Komi Republic.

Once in the Komi Republic, much of the first month was spent in the capital Syktyvkar, one of its suburbs - Ezhua, and the village of Kuratovo. This period of time was used for orientation, extensive local networking, and detailed planning of the logistics necessary to carry out the proposed research methods.

4.1.2 Village Selection

The fieldwork for this study took place in five different villages in the southern Komi Republic from May to August, 2005. The study villages were Kuratovo; Nebdeno;

Pomosdino; Griva; and Shoshka. Individual maps that illustrate the location of the study villages within their administrative regions are presented in Figures 12 to 16. Figures 1 to 3 in section 3.0 (Physical Description of the Komi Republic) provided more information on the locations of the administrative regions within the Komi Republic, as well as the location of the Republic within Russia.

Figure 12. Location of Kuratovo in the Sysol'skii Region (Strogov et al, 2004).

Figure 13. Location of Nebdeno in the Kortkeroskii Region (Strogov et al, 2004).

Figure 14. Location of Pomosdino in the Ust' Kulomskii Region (Strogov et al, 2004).

Figure 15. Location of Griva in the Koigorodskii Region (Strogov et al, 2004).

Figure 16. Location of Shoshka in the Syktyvdinskii Region (Strogov et al, 2004).

The villages were selected in consultation with local contacts as the study progressed. The criteria used to select each village were that the village population was approximately 500 – 2000 people so as to allow the efficient sampling of 25% of the households and maintain a level of similarity among villages; a local resident was willing to provide both accommodation and logistical support while the research was being conducted; the village could be accessed using public transportation; and each village was located in a different administrative region of the Republic in order to provide a broader representation of the southern Komi Republic.

4.2 Qualitative Methods

In each village, data were collected using participant observation, focus groups and informal interviews. Census reports and other literature were also collected while in the capital, Syktyvkar. Qualitative methods were chosen for the purposes of triangulation with the quantitative data; to allow new or unanticipated information to emerge; and to add flexibility and depth to the study. In all of the villages, qualitative and quantitative data were generally collected concurrently. The specific order in which the research methods were carried out varied from village to village in order to accommodate local scheduling and logistical considerations. The order in which the methodologies were applied did not appear to affect the results.

Since local residents provided accommodation for the researcher, the initial phase of research was spent getting to know the host family and establishing a rapport with them. A member of the household – in all cases a woman – introduced the researcher to members of the local community who included known NTFP gatherers, local shopkeepers, village administrators, the mayor and other active members of the community. Participant observation was conducted continuously throughout this period, both within the household and in the forest setting when opportunities arose to do so. Observations were recorded in the form of field notes and photographs.

Focus group meetings were also planned during this period using opportunistic and snowball sampling techniques. Opportunistic sampling involves following up on leads as they arise in the field, and snowball sampling involves original participants identifying new participants (Kemper et al., 2003). These sampling methods were chosen because they use

insider knowledge to maximize the chances of selecting individuals who are strongly appropriate for the study. Invitations to the focus group meetings were composed with the help of the host family to ensure that the appropriate language and tone were used. The invitations were then delivered to people identified by the host family or their friends as active NTFP gatherers. Because of scheduling and logistical reasons, sometimes the focus groups were conducted prior to the commencement of quantitative surveying, and sometimes they were conducted afterwards.

The focus groups consisted of 5 to 11 men and women who where known NTFP gatherers and were otherwise active within the community. The meetings were conducted in community facilities which included a meeting room of a senior citizens' institution, a museum, a youth centre, and two village administration offices. Community facilities, rather than individuals' homes, were chosen in order to decrease the likelihood of bias being introduced as a result of pre-existing and possibly negative relationships among participants which could have prevented people from participating in the focus groups or caused them to censor their responses. All participants were asked the same sorts of questions regarding NTFP gathering and their responses were recorded on both digital and cassette recorders. The use of two recording systems was extremely helpful for several reasons. In one case, the digital recorder malfunctioned, so the cassette recording was indispensable. In general, having the recorders set up on opposite sides of the room ensured that all participant responses were recorded and in instances where one recording was not clear, the other could be used to verify the statements being made. Upon return to Canada, the recordings from the focus groups were translated into English and transcribed simultaneously by the researcher.

Appendix 2 shows a listing of focus group participants as well as the questions they were asked.

During the time of field data collection, the local media in the Komi Republic was used to disseminate information about the research project whenever it was possible to do so. An announcement about the project was submitted to one local newspaper and interviews were given by the researcher to two others. A television interview and two radio interviews given by the researcher were also broadcast throughout the Republic. These communication efforts introduced the researcher to the local people, gave residents the opportunity to learn about the study, and established a basis from which further interactions could begin upon arrival in each study village.

4.3 Quantitative Methods

The quantitative survey method was chosen because the results can be statistically analyzed. Quantitative surveys were carried out concurrently with qualitative data collection. With the help of a Komi academic, the original questionnaires and consent forms that were developed in Canada were revised shortly after arrival in the Republic. The questionnaires were then pre-tested (Brace, 2004) by administering them to the participants of the first focus group. Pre-testing was done to test to ensure that the questions were not ambiguous and that their length was appropriate. The pre-testing process revealed some minor areas that needed adjustment; nevertheless, in the first village, Kuratovo, it was decided to use the questionnaires that had already been prepared. This decision was made because of the minor nature of the revisions and because it was not possible to access photocopy equipment to

produce updated questionnaires in a timely manner. Adjustments to the questionnaires were made at a later time and the revised questionnaires were distributed in the four villages that followed. A review of the data did not reveal any observable response differences that could be attributed to this change in the questionnaires between the village of Kuratovo and the other villages, where the revised questionnaire was used. Samples of the survey consent forms and questionnaires in both English and Russian can be found in Appendix 3.

Sample households were chosen according to the same procedure in all five villages. In each village, a household registry, which is kept at the administration office, was used to select 25% of the households for participation in the survey. Beginning at a randomly selected household, every 4^{th} household was chosen (Kemper et al., 2003). The surveys were then carried out by distributing questionnaires to sample households using several delivery systems. Each household was instructed to have the adult (over the age of 19) who last celebrated a birthday, to fill out the questionnaire. In all cases the questionnaire was accompanied by a consent form and sealable envelope to allow for confidentiality, if it was desired by the respondents. Between 40 and 49% of respondents signed the consent forms in Kuratovo, Nebdeno, Pomosdino and Griva. However, only one respondent out of 36 signed the consent form in Shoshka. This was likely because the majority of the questionnaires in Shoshka were filled out while the researcher was present and consent was given verbally rather than in writing.

In Kuratovo, focus group participants were asked to help with the delivery of the questionnaires (Table 6). Each focus group member selected several households belonging to people he or she knew and delivered the questionnaires to them. After a period of time,

the same focus group participants also collected the completed questionnaires and returned them to the researcher.

In Nebdeno, focus group participants also helped to deliver some of the questionnaires, but since all the questionnaires were not accommodated using this technique, those that remained were distributed by the unaccompanied researcher (Table 6). Survey respondents in both Nebdeno and Pomosdino were asked to return completed questionnaires to several local stores where the shopkeepers accepted them on the researcher's behalf. In Pomosdino, some of the questionnaires were given to focus group participants to deliver. Some were also delivered by the researcher while accompanied by the resident providing accommodation (host) who often helped with introductions and explanation of the project. However, because the host was not available for the entire delivery, remaining questionnaires were delivered by the researcher alone.

Finally, in both Griva and Shoshka, questionnaires were delivered to each household while accompanied by the hosts. In Griva, respondents chose to either fill the questionnaires out immediately or did so at a later time and returned them to the household where the researcher was staying. In Shoshka, the majority of respondents chose to fill out the questionnaires immediately and only a few chose to deliver them to the village administration office at a later time (Table 6).

Table 6. Questionnaire delivery and collection methods by village.

Village	Questionnaire Delivery Method
Kuratovo	Questionnaires delivered and collected by focus group participants.
Nebdeno	Questionnaires delivered by focus group participants or unaccompanied researcher. Completed questionnaires dropped off at local merchants by respondents.
Pomosdino	Questionnaires delivered by focus group participants, unaccompanied researcher and by researcher accompanied by village host. Completed questionnaires dropped off at local merchants by respondents.
Griva	Questionnaires delivered by accompanied researcher and returned to researcher's temporary residence.
Shoshka	Questionnaires delivered by accompanied researcher and the majority were returned immediately with a small proportion delivered to the village administration office.

4.4 Opportunities and Constraints Regarding Data Collection

The researcher was introduced to Ms. Nina Alexandrovna Nesterova by Dr. Michel Bouchard, who is a professor at UNBC. Nina Alexandrovna was instrumental in establishing contacts in the Komi Republic. She is well known and respected as a researcher and instructor at the Syktyvkar State University. She is also well connected throughout the Republic as a result of her advocacy for the development of Komi ethnotourism and for her efforts in the preservation of Komi culture. With the help of Nina Alexandrovna, the researcher was able to meet and establish connections with key people in study villages, academic institutions and governmental organizations.

The researcher's Russian heritage also played a significant positive role in enhancing her research opportunities. This was mainly because people appreciated her knowledge of

the Russian language. As a result, they quickly accepted her into their daily lives and appeared to be comfortable in her presence. When she chose, she was able to use her knowledge and understanding of the Russian culture and language to not draw attention to her purpose and foreign background, while making observations. This may have enabled her to have made truer observations without the participants modifying their actions in her presence.

In the instances where the researcher's Canadian citizenship was known, it sometimes acted as a constraint. There is little distinction made between Canadian and United States (American) citizens and a historic distrust of Americans remains pervasive in Russia. This was evidenced in several situations when the researcher was being introduced as an American. When she corrected her host saying that she was, in fact, Canadian, the usual response was, "Oh well, it's almost the same thing." In one case, an individual refused to participate in the survey because he believed the researcher was an American spy. Conversely, because some people in the villages do not often have contact with foreigners, it is possible that they changed their responses to fit what they thought the researcher was interested in hearing. While it is difficult to know when this may have occurred, it is not considered to be a major problem, since the questions that were asked generally compelled respondents to give simple and objective answers (e.g., gender, age, occupation, etc.).

4.5 Qualitative Data Analysis

Content analysis was performed on the transcripts of the focus group meetings, and the field notes from the participant observations and informal interviews, in order to address

the objectives of this thesis. Specifically, the transcripts of focus groups and informal interviews, and the field notes were read several times. The first reading was a general reading to familiarize the researcher with the contents. During the second reading the responses or observations that related to the research objectives were highlighted. For example, while reading the transcripts and field notes for the second time, references to socioeconomic factors (e.g., gender, age, etc.) or product type (e.g., berries, mushrooms, etc.) were highlighted to identify each factor or product. The transcripts and field notes were then read a third time, at which time the data were checked to ensure reference to socioeconomic factors and types of products were not missed during the second reading, and to examine the data for trends or information that could be important to the study, but were unanticipated. Examples of unanticipated data are the prevalence of references to alcohol abuse and the connection of NTFPs to Komi culture.

Once the reading process was completed, the highlighted excerpts were structured into separate documents that were organized by factor or product category. Although the organizational structure was the same, the data from the focus groups, field notes and informal interviews were kept separate, by method. This was done to keep each method intact so that the results could be compared to each other, or triangulated.

The data resulting from each qualitative method were then compared to each other, and to the results obtained using the quantitative method. Similarities and differences among the research methods were recorded, and then reviewed to determine whether or not the results of each method supported or rejected the research hypotheses and objectives (Berg, 2001). New or unexpected information was also made note of as it emerged. For example, while culture and alcoholism were factors that were not specifically being investigated in this

study, they continually emerged from the data, and were therefore included in the results. This was also information that was not necessarily captured by the quantitative questionnaires.

4.6 Quantitative Data Analysis

Four types of analyses were performed on the quantitative data. The types of analysis included descriptive statistics, contingency tables, chi-square tests and logistic regression. Microsoft Excel was used to generate the descriptive statistics, while the statistical software package, Statistical Programme for the Social Sciences (SPSS) was used to create contingency tables, and perform the chi-square tests and logistic regression. The descriptive statistics were compiled to give a general summary of the survey data. The contingency tables were used to test whether the independent and dependent variables were related to each other or not, and are shown in percentages (relative frequencies) (Johnson and Kuby, 2000). The chi-square tests were used to test the hypotheses (Johnson and Kuby, 2000), and logistic regression was used to predict dependent variables (Tabachnick and Fidell, 2007). A probability-value, or p, of .05 was used for the chi-square tests and logistic regression. If the p was $<.05$, the result was considered significant, but if it was $\geq.05$ then it was considered not significant. The contingency tables and chi-square tests were chosen because the data collected using the questionnaire were nonparametric (i.e., not normally distributed), and composed of a mix of discrete and continuous variables, that were both nominal and ordinal in nature. Logistic regression was chosen because it is more flexible than other techniques, and does not require that all of the predictors are continuous variables, normally distributed,

or linearly related (Tabachnick and Fidell, 2007). The flexibility of logistic regression was important to this study because of the nature of the data, as described above (i.e., nonparametric, etc.).

The dependent variables in this study were the eight main NTFP types while the independent variables were the six key socioeconomic factors, plus a village identifier. "Village" was added as a variable when data from all five villages were combined and analyzed to verify that the geographic location of the villages is not a factor which affects NTFP collection. The independent variables are listed and briefly described in Table 7 below.

Table 7. Independent variables: Village identification and socioeconomic factors.

Variable	Variable Description	Variable Type
Village	Villages are coded as follows: Nebdeno = 1, Griva = 2, Shoshka = 3, Pomosdino = 4, Kuratovo = 5	Nominal and Discrete
Gender	Male or female	Nominal and Discrete
Age Category	Up to 19, 20-24, 25-34, 35-44, 45-54, 55-64, 65+ (based on categories used in Russian census)	Ordinal and Continuous
Educational Level	Elementary, high school, technical, university (categorized by researcher)	Ordinal and Continuous
Occupational Type (Category)	Unemployed, pensioner or disabled (previous occupations unknown), technical/semi-professional, professional (categorized by researcher)	Nominal and Discrete
Number of People in a Household	One to six	Ordinal and Continuous
Income Level	Rubles per month: 0, 0-1000, 1000-3000, 3000-6000, 6000+ (categorized by researcher)	Ordinal and Continuous

The socioeconomic (independent) variables where analyzed using each of the eight main types of NTFPs (dependent variables) which were identified by respondents in the questionnaires. In total, respondents reported collecting 15 different types of products; however, some of the NTFPs were only collected by a few individuals. For this reason, collection of only the most common NTFPs was analyzed. The other less common NTFPs reported were: hay, roots, pine nuts, lichens, fir boughs and pitch. For a full listing of the species collected, see Appendix 1. The most common NTFP types, which are the dependent variables in the analyses, and brief descriptions of them, are listed in Table 8 below.

Table 8. Dependent variables: NTFP types and descriptions.

NTFP Type	Description
Firewood	Fuel within the household
Mushrooms	Various species used for food
Berries	Various species used for food
Medicinal plants	Various species used for food and medicines
Birch bark	Fire starter and crafts
Birch sap	To drink as a beverage and for medicinal purposes
Birch boughs	Twig brooms for sweeping and birch foliage for saunas
Chaga	*Inonotus obliquus* fungus used for tea

Although age category, educational level, household size and income level are not strictly continuous variables, they are being treated as such for the purposes of data analysis. Tabachnick and Fidell state that, "Sometimes discrete variables are used in multivariate analyses as if continuous if there are numerous categories and the categories represent a

quantitative attribute (Tabachnick and Fidell, 2007, p. 6)." Having too many categories for an independent variable negatively affects the goodness-of-fit of logistic regression models. This is because, "The goodness-of-fit test compares observed with expected frequencies in cells formed by combinations of discrete variables (Tabachnick and Fidell, 2007, p. 442)." Having too many categories causes the expected frequencies to become too small which results in the model having little power (Tabachnick and Fidell, 2007). Power is defined as, "the probability of rejecting the null hypothesis when the null hypothesis is in fact false (Hurlburt, 2003, p. 580)." Therefore, by treating age category, educational level, household size and income level as continuous variables, the number of categories used in the logistic regression models is reduced, and the goodness-of-fit is not detrimentally affected.

The variables of village, gender and occupation category are truly nominal and discrete. On the other hand, the variables age category, educational level, and income level each have numerous categories and the categories represent quantitative attributes which while presented as categories, are actually based on an underlying continuous scales (Tabachnick and Fidell, 2007). It is therefore acceptable to treat them as continuous variables (Tabachnick and Fidell, 2007). For example, when a person is receiving an education he or she progresses through his or her program of study in order from a numerically lower grade or level, to one that is higher. In the Russian education system, as in other educational systems around the world, this would mean progressing from elementary school, through high school, until finally graduating from either technical school or university. Table 7 explains the numerical nature of the continuous variables in the "Variable Description" column.

In order to ascertain association among the socioeconomic variables and NTFP types, contingency tables were created and chi-square tests were performed. This was done to examine whether the collection of different types of NTFPs was associated with any of the socioeconomic variables. A chi-square test was also used to test the association between gender and the reasons people collected as well as gender and how the respondents used what they collected within their households. The reasons for collecting were listed as household use, commercial sale, private sale, trading, or gifting. The uses within the household were listed as food, heating, medicine, forage, clothing, art and religious purposes.

Logistic regression analyses were performed in order to establish which of the socioeconomic factors (independent variables, see Table 7) were the best predictors of NTFP collection, by NTFP type. There are two potential values for the dependent variable which are 0 (do not collect) and 1 (collect). A model was created for each NTFP type in order to determine whether the collection of different types of NTFPs was affected by socioeconomic factors, and by which factors. The model produced by logistic regression is nonlinear therefore, the equations used to describe the outcomes are more complex than those for linear regression. The outcome variable, $\hat{Y}$, is the probability of having one outcome or another based on a nonlinear function of the best linear combination of predictors; with two possible outcomes (Tabachnick and Fidell, 2007):

$$\hat{Y}_i = \frac{e^u}{1 + e^u} \qquad [1]$$

where $\hat{Y}$ is the estimated probability that the ith case ($i = 1, 2, \ldots, k$) is in one of the categories (do not collect or collect) and u is the usual linear regression equation:

$$u = A + B_1X_1 + B_2X_2 + \ldots + B_kX_k \qquad [2]$$

where u is the dependent variable or NTFP type (see Table 8), A is the model constant, the B_j are the coefficients or independent variables, such that B_1 = village, B_2 = gender, etc. (see Table 7) and X_j are the predictors for k predictors (j = 1, 2, …, k). This linear regression equation creates the logit of log of the odds:

$$\ln\left(\frac{\hat{Y}}{1-\hat{Y}}\right) = A + \Sigma B_jX_{ij} \qquad [3]$$

That is, the linear regression equation is the natural log ($\log_e$) of the probability of being in one group divided by the probability of being in the other group (Tabachnick and Fidell, 2007). In this thesis, one group is those who do not collect ($\hat{Y} = 0$), and the other group is those who do collect ($\hat{Y} = 1$).

4.7 Credibility and Internal Validity

One reason for linking qualitative and quantitative research methods is to enhance the "truth value" (Lincoln and Guba, 1985) of a study, because it can generally be assumed that no research methodology is free of errors (Erzberger and Prein, 1997). The concept of "truth value" refers to how "true" the findings of a particular inquiry are for the particular respondents and specific context in which the inquiry was carried out. The qualitative and quantitative methodological traditions have different nomenclature for this concept (Teddlie and Tashakkori, 2003). In qualitative research, the term "credibility" is used, while in quantitative research the analogous term is "internal validity" (Lincoln and Guba, 1985).

Because the qualitative and quantitative research methods in this multimethod study were kept separate and distinct, both credibility and internal validity will be discussed.

There are several threats to credibility in this study. As mentioned above, the subjects of both the participant observation and the focus groups may have been influenced by the presence of the researcher. Specifically, as a result of their desire to be helpful, participants may have tailored their responses to fit what they thought the researcher wanted to hear. Also, the selection of study participants may have been biased as a result of the sampling methods used to select them. Participants were selected for the qualitative portion of the study using opportunistic and snowball sampling techniques. Opportunistic sampling involved selecting individuals because they were readily available. Snowball sampling is defined as a technique for finding research subjects where one subject gives the researcher the name of another subject who in turn gives the name of another (Vogt 1999). The potential for bias in using these techniques lies in that research subjects have not been randomly selected and therefore, may not be representative of the population being studied. However, these sampling techniques pose a low risk to credibility in this study because they were used in conjunction with the qualitative methods which, in turn, were triangulated with the quantitative methods. In other words, by using a multimethod approach, no one method was solely relied upon, and the results generated by each method were scrutinized against the results of the others.

While these methods used insider knowledge to maximize the chances of selecting individuals who were strongly appropriate for the study, there are inherent sources of bias in them. Specifically, the socioeconomic characteristics of the participants, such as their gender, age, educational level, occupational type, household size and income, may not have

been as representative of the general population as they could have been, had different sampling techniques been used.

There are also several threats to internal validity in the quantitative portion of this study. Although the respondents chosen to fill out the questionnaires were selected using the same systematic sampling method, there were variations in how the questionnaires were administered. The variations in the way questionnaires were delivered to, and collected from, participating households may have affected both the sample sizes and the responses participants provided in the questionnaires. Table 10 in Section 5.3.1 below provides a summary of response rates by village.

Although threats to credibility and internal validity do exist in this study, they are mitigated through the use of triangulation and a multimethod approach. Once the results of each method are analyzed separately, they will be compared to the results of the other methods to examine the degree to which each will confirm or support the other (Erzberger and Prein, 1997).

4.8 Transferability and External Validity

Just as the nomenclature for the concept of "truth value" varies between qualitative and quantitative methods so does that of the concept of "applicability". "Applicability" is the extent to which the findings of a particular inquiry are applicable to other populations in other contexts (Lincoln and Guba, 1985). To express the concept of "applicability," the term "transferability" is used in the qualitative research tradition, while the term "external validity" is used in quantitative research.

Again, there are several threats to both transferability and external validity. This study was carried out in a particular geographic location over a specific period of time. The types of NTFPs available vary depending on their physical environment as do the factors associated with their use. Social and economic conditions change over time; therefore, the socioeconomic factors that affect NTFP use also vary temporally. Because of similarities in social, economic and ecological conditions, some generalizations regarding the socioeconomic factors that affect NTFP collection may be made to other parts of the Komi Republic and even other comparable regions of Russia. However, because of the role culture, politics, economics, and ecology play in NTFP collection, the findings of this study cannot be used to make generalizations to other geographic locations in the world.

Chapter Five
Results and Discussion

5.1 Qualitative Results

The qualitative methods used in this study were applied concurrently and included participant observation, focus groups and informal interviews. Results generated by participant observation and the focus groups are presented separately, while the results of the informal interviews are included with each of these two methods (participant observation and focus groups).

5.1.1 Participant Observation Results

Socioeconomic Factors

Participant observation was done while the researcher was inside village residents' homes, outside in the wider communities, and while in the forest collecting NTFPs with village residents. These observations revealed that the households visited in the study villages use NTFPs. Based solely on observations, however, it was not always clear who had collected the NTFPs observed. For example, in households with more than one member, it was not always obvious who collected the berries for the jam that was served at tea, who collected the firewood to heat the home, or how the displayed birch bark artefacts were obtained. The examples described below give details regarding the results of participant observation and identify gatherers by the village they are from, their occupation, and other socioeconomic characteristics, as well as the NTFPs they were observed collecting.

In Kuratovo, an 18-year-old young man, from a subsistence farming family of six, collected birch bark from which he made decorative and functional crafts such as dishes, baskets, hats, shoes and ornaments. He collected the birch bark while he was helping his father and their neighbour cut firewood for both families. The two households combined their efforts and resources in order to collect firewood. The father and son provided labour in exchange for the use of the neighbour's power saw and the tractor with which the firewood was hauled back to the village.

In another instance in Kuratovo, Elena Vital'evna, a 45-year-old social worker and her 22-year-old son, subsistence farmer Andrei Nikolaevich, went out to collect birch sap with their neighbour, Lubov Iur'evna who was the Director at the Centre for Komi Culture in Ezhua. In addition to the birch sap, Elena Vital'evna also collected medicinal plants which included the leaves of lingonberry (*Vaccinium vitis idaea*), the freshly flushed buds of spruce and pine branches and the cones of horse tail (*Equisetum arvense*).

Some avid collectors in Nebdeno included the young mayor of the village, Valerei Vladimirevich, who's preferred NTFP was cloudberry (*Rubus chamaemorus*) and a 73-year-old woman who was a retired forest worker and collected medicinal plants. The retired forest worker was quite private about her collection habits and how she used what she collected. Nevertheless, on several occasions she was observed gathering plants near her home then later giving them as gifts to her friends and neighbours. On another occasion in Nebdeno, a 54-year-old head cardiac nurse who divided her time between the village of Nebdeno and the city of Syktyvakar where she worked, was observed collecting common tansy (*Tanacetum vulgare*) while returning home from a riverside beach. She placed the tansy in a vase on the veranda in order to deter flying insects.

In Pomosdino avid NTFP collectors included Iulia Vladimirovna, a school teacher in her 50s, who collected fresh herbs for salads and tisanes throughout the summer. Iulia Vladimirovna also added stinging nettles (*Uritica dioica*) to hot water and used it as a skin tonic when bathing in the bathhouse or "banya". She and her friend, Ianina Ivanovna, were later observed collecting wild rose (*Rosa sp.*) petals, stone bramble (*Rubus saxatilis*) leaves, unripe berries from honeysuckle (*Lonicera edulis*), wild strawberry (*Fragaria vesca*) leaves, and the newly flushed tips of pine branches. The women dried most of the wild rose petals to preserve them for winter use, but combined some of them with the remaining herbs to make tisanes which they drank as tonics to improve overall health.

In an informal interview, Veniamin Petrovich Uliashev, a retired forester in Pomosdino, further confirmed that everyone in the village collects NTFPs for personal use, irrespective of socioeconomic factors or ethnic background. He himself collected mushrooms and berries for personal use, as well as for his children and their families. Once he had supplied his extended family with all the mushrooms and berries they needed for the year, he sold the extras and used his earnings to pay for the gasoline expenses he incurred driving to his collection spots. When further questioned about why he continues to collect, he said that he felt very comfortable in the forest and that gathering NTFPs was something he had been doing since he was a four-year-old child. When he was growing up, the youngest of 13 children, it was his job to collect various NTFPs for the household. By age six, he was already cutting and gathering firewood on his own. Three of his older brothers were killed in the Second World War, and his other siblings were away studying, so it was his responsibility to help his mother with NTFP collection. His early experiences in the forest led Veniamin Petrovich to eventually choose a career in forestry. In keeping with Komi

tradition, Veniamin Petrovich believes that the trees in the forest have mystical and healing properties. When asked about these beliefs he explained that the "whispers" of the birch trees can be felt by placing a hand on the bark on quiet spring days before the buds burst. He further explained that a person could receive healing from the whispering birches by leaning up against the boles of the trees to absorb their healing properties.

In Griva a Nina Afanas'evna, a retired farm worker, was late for a focus group meeting because she was busy gathering medicinal herbs. In an informal interview, she explained that herbs must be collected after July 6. She further explained that on July 7, which is a church holiday called "the day of Ivan Kupala," nettles must be placed on the threshold and all the window sills of a home in order to keep evil spirits out. Nina Afanas'evna is an avid collector not only of medicinal plants, but berries and mushrooms as well. She said that they were her favourite things to collect and she collects for herself, her grown children, nieces and nephews. In the past, she had been able to collect up to 18 pails of cranberries (*Oxycoccus palustris* or *O. microcarpus*) for herself and her immediate family.

Galina Lionidovna, works as a social worker during the day and as a security guard for a local school at night. Galina Lionidovna and her two friends, a man and his wife, all approximately in their forties, were observed collecting cloudberries on a bog near their village of Griva. In order to get to the bog, the group drove several kilometres, paddled across a river in a boat, then walked several more kilometres into the forest to reach the bog. They each collected two to three litres of berries in a couple of hours then returned to the village to preserve the berries for their own household use.

In Shoshka, a nurse was observed cleaning and preparing a certain species of mushroom before other villagers were aware that the season for that particular species had

begun. The woman was approximately in her late thirties or early forties and in addition to the mushrooms she had collected she also gathered some herbs which she served in a tisane. Her friend, Olga Sergeevna, a school teacher in her forties, went out into the forest every morning to gather some mushrooms for that day's lunch. Along the way she also gathered birch boughs for the banya. She collected several bunches of birch boughs every day, and was thus able to gather enough for the entire winter. She explained that she made sure she had one birch "broom" per family member, per week, with a few extras reserved for guests.

In one instance, in the village Shoshka, a woman who is known by neighbours to be relatively wealthy, was observed cleaning bilberries (*Vaccinium myrtillus*) she had just collected. Conversely, another family of five in the same village was struggling with poverty and alcoholism but was also observed preparing mushrooms they had collected.

Widespread use of non-timber forest products was observed in all of the villages and no particular socioeconomic factor appeared significant in determining whether or not people collected NTFPs. Based on observations, gender did not play a significant role in collection, since both women and men were observed either carrying NTFPs to their households, or using them within their homes.

Based on participant observations, ethnicity was not a factor that affected NTFP collection either. People of many ethnic backgrounds were observed collecting and using NTFPs in similar ways.

Age is another factor that was not observed playing a role in whether or not people collected. Both elderly people and children were observed collecting NTFPs near their homes. Adults, who had the means and ability to do so, were often observed driving, boating

or trekking from the forest with NTFPs such as berries, mushrooms, medicinal plants, firewood and birch boughs.

It was difficult to observe whether educational level played a role in the collection, since educational level is a factor that is not outwardly visible. Occupation, which in many cases can be connected to educational level, did not appear to affect collection. The number of people living in the household did not affect collection either. Households with one, two, three, four, five, and six people in them were all observed either collecting or using NTFPs within their homes. Finally, to the extent that it was possible to make assumptions about relative wealth based on outward appearances and occupation, income did not appear to affect collection. People with a variety of socioeconomic characteristics were observed collecting a variety of NTFPs. Participant observation did not reveal any trends relating socioeconomic factors to collection patterns.

Reasons for Collecting and Uses of NTFPs within the Household

Aside from the utility of NTFPs within the household, the activity of collecting is, in itself, an important form of recreation in the Komi Republic. People enjoy going out into the forest and they value feeling close to nature, the fresh air and the solitude. Many, as expressed by Veniamin Petrovich in Pomosdino above, go to the forest for relaxation and spiritual renewal. The forest and forest related activities, such as NTFP collection, are deeply rooted in the Komi culture. This can be seen in the Komi legends and folklore associated with the forests.

Household Use

Participant observation revealed that one of the main reasons for NTFP collection was for their use within the household. Some common uses of NTFPs observed included the use of berries, mushrooms and greens for food; plants for medicines; grasses and herbs for forage; firewood for heating; birch bark for shoes and other crafts; moss for home construction; and plants for religious or spiritual practices. The particular species used and the nature of their use varied from household to household but was uniform among the villages in general.

The selection of fresh fruits and vegetables in Komi village stores is limited even in the summer so, according to study participants, people gather NTFPs to add variety to their diets. In addition, like Russians, the Komi say that they prefer to use local, natural foods and materials whenever possible. For example, although synthetic building insulation is available, people continue to build their homes using moss as insulating material. This is but one example of how the Komi people continue to rely upon NTFPs from their local forests, rather than purchase comparable synthetic goods which are imported from other regions.

Berries

The presence of berries in village households was ubiquitous. Although the type of berries collected by each household depended on personal preferences, the species most commonly observed were bilberry, cloudberry, lingonberry, cranberry, and blueberry (*Vaccinium uliginosum*). Study participants reported that using berries in the household was

essential. Berries are used in the household to make jams, preserves or "mors" which is a fruit drink. Cranberries and lingonberries are often simply put into jars and left in a cold place without any kind of processing. The high acid content in the berries naturally preserves them and keeps them from spoiling. The relatively simple preservation techniques associated with cranberries and lingonberries make them preferred over bilberries and blueberries. Bilberries and blueberries require large amounts of sugar to preserve them and this means extra expense. Participants reported that as a result of the added expense associated with bilberries and blueberries, poorer households relied more on cranberries and lingonberries.

While the berry species listed above are the most common and most sought after, other forest berries were also observed in village homes. These included the following berry species: red currant (*Ribes spicatum* and *R. hispidulum*), black currant (*R. nigrum*), high-bush cranberry (*Viburnum opulus*), mountain ash (*Sorbus aucuparia*), choke cherry (*Padus racemosa*), wild strawberry (*Fragaria vesca*), wild raspberry (*Rubus ideaus*), and rose hips (*Rosa sp.*).

Mushrooms

Although mushrooms were present in many households, there was more variation in the type of mushrooms used and the frequency with which their use was observed than was the case with berries. Some villagers said they enjoyed the activity of collecting mushrooms but did not like to eat them. Instead they would collect the mushrooms then either give them away to friends and family or sell them for extra spending money. Some people collected and ate mushrooms while they were in season but, unlike berries, did not preserve them for

consumption during other times of the year. The most common ways of preserving mushrooms were by drying them (e.g., porcini (*Boletus edulis*)), salting them (e.g., "gruzd' nastoiashchii" (*Lactarius resimus*)) or pickling them (e.g., slippery Jack (*Ixocomus luteus*)). Some species (e.g., birch bolete (*Leccinum scabrum, L. aurantiacum*)) were not preserved but cooked and eaten immediately after picking. Yet other mushrooms, such as "syroezhki" (*Russula integra, R. azurea,* and *R. fragilis*), were often eaten raw. The Russian common name "syroezhki" when directly translated means "raw-eats." Several species of mushrooms including chanterelles (*Cantharellus cibarius*) and morels (*Gyromitra esculenta*) are only collected for sale because, according to Komi tradition, villagers believe them to be inedible. According to a focus group participant in Pomosdino, "...in the Komi language they call these mushrooms "pon chak" which means "dog's mushroom" and is taken to mean toadstool. Participants reported that rather than using them within the household, both chanterelles and morels are dried and exported to Europe, where they are highly prized.

Medicinal Plants

Forest plants were often collected and added to salads and soups. Some of the greens that were gathered and eaten include the leaves of currants, birch, stinging nettles, common sorrel (*Rumex confertus*), common chickweed (*Stellaria media*), and dandelion (*Taraxacum officinale*). These and other plants were also used extensively to make tisanes and drunk instead of regular tea, as well as for medicinal reasons.

It was observed that many forest herbs were sold in pharmacies alongside drug remedies. Russian physicians write prescriptions for both conventional drugs and herbal

remedies when treating their patients. This was observed firsthand when the researcher was prescribed linden flowers (*Tilia cordata*) and colt's foot (*Tussilago farfara*), in addition to conventional therapies, to treat a bronchial infection. While medicinal herbs are available in pharmacies, many village residents prefer to collect their own supply from the forest. For example, in Nebdeno the researcher's elderly host had a chronic cough which she treated with a mixture of herbs she gathered herself in the forest near her home. In addition to the tradition of using herbal medicines, the woman explained that when difficult economic times began in the 1980s and 90s, the prices of drugs rose and they became difficult to obtain. As a result, she explained, more people began returning to traditional herbal medicines.

While people were observed both collecting and using forest plants for medicines, it was also observe that some were reluctant to talk about it. As mentioned earlier, one particular woman in Nebdeno was known in her village as a medicine woman. However, when interviewed on the subject, she refused to speak about medicinal plants at all. She said that she did not want to be held responsible if someone became ill because of something she had suggested. Nevertheless, when the rather fruitless interview was over, and the recording equipment was turned off, she cryptically mentioned that she would be out collecting immature pine cones the next day. When asked if they would be used for medicine, she smiled and replied with a simple, "Da [Yes]."

Firewood

The only method for heating village homes is through the use of wood burning stoves. As a result, all households require firewood. Wherever possible, villagers reported

trying to obtain firewood themselves in order to avoid the costs associated with hiring someone else to collect it for them. Members of some households were not able to collect their own firewood due to factors such as old age, disability, illness, lack of expertise, or the lack of the necessary equipment and transportation. In these cases, people hired other village residents to collect and deliver firewood for them.

Birch bark

Birch is a species that is particularly important to the Komi (Smilingis, 2005) and is used for many purposes. Up until the arrival of the Christian missionary Stephan Permskii (1340-1396), the Komi were pagan and as a result some pagan beliefs survive in the villages to this day (Smilingis, 2005). These beliefs include the worship of trees. While each species of tree has a specific spiritual significance and practices associated with it, birch is considered particularly sacred. Regional specialist Anatolei Antonovich Smilingis, related a legend which illustrates the place of birch in Komi mysticism.

According to Anatolei Antonovich, upon his arrival among the Komi people, Stephan Permskii began to cut down a sacred birch tree at the mouth of the river Vim. The tree haemorrhaged blood for four days while he chopped it. Once he finally felled the tree, Stephan Permskii had a chapel built on the site where the birch had stood. Two hundred years later, when the chapel was being renovated, the stump of the sacred birch was discovered beneath the structure. Since the Komi people still believed that the birch was sacred, the remnants of the stump were completely removed by villagers who were eager to have a piece of it in their homes. Anatolei Antonovich further explained that it is his

understanding that science has now shown that birch trees emit energy waves that are considered to have a positive impact on human health. As a result of this continued faith in the special powers of birch, many Komi believe that each person must choose his or her own birch tree then go to the forest to visit it periodically to receive its positive health effects.

Birch bark is used for making various crafts (baskets, talismans, hats, slippers, etc.), for fire starter and in home construction. Birch bark is known for its antimicrobial properties and it is said that food and milk products stored in birch bark keep without spoiling longer than in containers made of other materials.

These same antimicrobial properties are the reason birch bark is used in home construction. A layer of birch bark is placed between the lowest two layers of logs or timbers during the construction of a home. This was observed in Griva where a group of men was observed building a new home. When questioned as to why they placed the birch bark where they did, they explained that it prevented the lower logs from decaying. They went on to say that birch bark was also used to line window sills for the same reason. The men said that birch bark is collected around June 20th. Other residents did not know the exact date when birch bark is collected but instead said that it was when the wild roses (*Rosa sp.*) bloom.

While traveling throughout the Komi Republic, birch trees which had been stripped of their bark were observed both along roadsides and in forested areas that did not otherwise appear to be impacted by humans. Every household visited in the villages, and many households in the city as well, had birch bark artefacts on display. For example, Valerei Vladimirevich in Nebdeno served candy and sugar in birch bark dishes he had made himself. Although some people did make their own birch bark dishes and crafts, others either bought such items or received them as gifts. While children and youth are taught how to make birch

bark crafts through educational programs such as those once provided by the Centre for Komi Culture in Ezhua, making crafts from birch bark is a specialized skill which is not practiced by everyone.

Birch Sap

Although the use of birch sap was not widely observed, its collection was witnessed in Kuratovo and its sale in canned form was observed in a Pomosdino food store. As with the evidence of birch bark collection, birch trees that had scars from previous years' tapping were observed in the forested areas surrounding the villages.

Birch Boughs

Birch was also observed being used to make brooms. Specifically, two types of brooms were observed in use. The first type of broom, or "venik", was used for steam bathing in the bathhouses or "banyas". In the villages, people bathe almost exclusively in banyas. The owners of every banya visited provided the researcher with bundles of birch boughs for bathing. The boughs are collected from birch saplings before the middle of July to ensure that when they dry the leaves do not fall off. Then, when bathing, the bundles of boughs are soaked in hot water and used to slap the body while in the banya. Each year, every household that has access to a banya collects enough birch boughs for their household with a few extras reserved for guests. Birch bough brooms are even collected and sold to the public banyas in the city where they are resold to patrons.

The second type of broom is the birch twig broom which is used for sweeping. These brooms were observed in villages where they were used for yard maintenance and in the city where they are used for sweeping the streets.

Moss

Another common NTFP observed in almost every village household was moss. Moss, generally polytrichum (*Polytrichum sp.*), is used as insulation in the construction of log homes. With the exception of a few concrete homes, village houses are generally made of round logs or rough-hewn timbers. The moss is placed between layers of logs or timbers to fill gaps and prevent heat from escaping the home. Building homes using moss as insulation is a traditional practice but one that continues to this day. As mentioned earlier, the construction of a new home was observed in the village of Griva where several men were building a house using timbers and moss. When interviewed, they explained where and how they collected the moss and why they continue to use it. The Komi consider moss to be ecologically clean and thus superior to synthetic insulations which are not yet widely available in the villages.

Spiritual and Shamanic Uses

During the week before the Russian Orthodox Church celebration of Easter, most households in both the villages and towns tuck either pussy willows (*Salix sp.*) or common juniper (*Juniperus communis*) in the doorjambs and window frames of their houses. This is

done to protect the home and ward off evil spirits. Stinging nettles are used in much the same way during the July festival of Ivan Kupala as mentioned by Nina Afanas'evna earlier. Other plants are also used for spiritual or religious practices.

Due to the historic spiritual value of birch, parts of the tree are still used to make various articles not only for healing but also for use as spiritual talismans. For example, birch bark bands are woven and worn around the head to reduce high blood pressure and cure headaches (Smilingis, 2005). It is believed that when the bark next to the skin turns a reddish colour it has absorbed the illness of the wearer. It must then be disposed of only by burning it. According to Komi beliefs, the headbands must not be sold because if sold they lose their healing power. As a result, these bands are only given as gifts. These and other similar beliefs originated prior to the arrival of Christianity in the Komi Republic in the 14th century but continue to be practiced today (Smilingis, 2005).

Aspen is another species used in traditional Shamanic healing. According to Lubov Iur'evna, thin disks of aspen should be worn around the neck under clothing in order to ward off evil spirits and illness. She also explained that a piece of aspen wood can be placed under the bed of a sick person. When the wood discolours, it is believed that it has absorbed the illness and evil spirits afflicting the patient. It must then be burned in a stove but the person burning it must not look at the flames until the wood has completely burned. If the person burning the aspen looks at the flames, he or she risks acquiring the illness which is believed to be trapped within the wood. While some spiritual practices involving NTFPs are well known, yet others are shrouded in secrecy and it is considered taboo to discuss them.

Forage

Although forage is generally gathered from fields dedicated to hay production, there is a shortage of such areas and some people are forced to the margins along forests in their attempt to feed their livestock. In Shoshka, the researcher witnessed a tumultuous community meeting where the shortage of pastureland was being discussed. Residents were upset over their inability to obtain enough forage to feed their livestock. In Griva, where the same problem is being experienced, an elderly lady was observed cutting hay with a scythe along the edge of the road. When asked why she chose that spot to collect hay for her cow she said that she was not allocated a pasture and could not afford to buy hay. Instead, she would cut small quantities of grasses from the unclaimed roadsides and other grassy patches wherever she found them.

Commercial and Private Sale of NTFPs

While NTFPs are most commonly gathered for household use, they are also collected and sold in order to supplement the household income. Village residents employ a variety of livelihood strategies in order to meet their household needs. Aside from paid work, these strategies include subsistence agriculture and supplemental NTFP collection.

Many people were observed selling NTFPs along roadsides, and makeshift kiosks on the streets of both Syktyvkar and its suburb Ezhua. The main NTFPs collected for sale are mushrooms and berries. There is a particular stretch of highway in the Kortkeroskii region, between Syktyvkar and Nebdeno, which is always lined with NTFP vendors once the

mushroom and berry season begins. Local residents explained that a settlement near this stretch of highway was initially established to house forest workers. However, once forestry operations in the area ceased during the economic turmoil of the early 1990s, the residents of the settlement started collecting mushrooms and berries and coming out to the highway to sell them.

As noted in the interview with Veniamin Petrovich in Pomosdino, many industrious families collect large amounts of mushrooms and berries for sale. According to Veniamin Petrovich, one family made enough money to buy a Niva jeep by collecting mushrooms. He mentioned one family of five that was able to collect and sell up to 500 kilograms of mushrooms per day. He then noted that some of the single men in the community simply collected several kilograms of mushrooms at a time in order to make just enough money to buy alcohol.

This pattern of collection for sale was apparent in the other villages as well. In Griva, some NTFP traders were even known to exchange alcohol for mushrooms and berries directly rather than dealing with cash. This became an issue of concern in the community to the point where many of the villagers, including the mayor, began to protest.

In Nebdeno, Griva, and Pomosdino, the practice of collection of berries and mushrooms for sale is well developed. According to Veniamin Petrovich while everyone collects NTFPs for domestic use, about 300 of the 1700 people in Pomosdino and the surrounding villages administered by it, collect NTFPs for sale in large quantities. Access to transportation infrastructure has enabled companies such as Matreko Kholod and local co-operative organizations to establish collection stations in these villages.

Generally, villagers collect berries and mushrooms and deliver them to a village collection station. Representatives from the company for which the collection is taking place then periodically travel to the villages to pick up the NTFPs and transport them to processing plants in the city. Berries and mushrooms are processed and exported to markets in Moscow and abroad. Residents of Kuratovo and Shoshka collect NTFPs to sell locally. Due to the absence of collection stations within these villages and difficulties with the availability of transportation, people in these villages generally do not collect large quantities of NTFPs for commercial sale.

5.1.2 Focus group results

Socioeconomic Factors

The participants in the focus groups expressed their belief that various socioeconomic factors affect the collection of NTFPs in various ways. However, upon discussion, contradictions generally arose, thus putting the original assertions into question. Sometimes it was a different participant who challenged the opinion that a factor affected NTFP collection in a certain way, at other times the participant making the original claim contradicted him or herself.

For example, on the question of gender, in Kuratovo, the women in the group claimed that they collect more berries than men do. The women claimed that men prefer to collect mushrooms and are slow, clumsy and avoid collecting the small berries. The man in the group took exception to this claim stating that, in his family, he collects the most berries. When it came to birch bark some of the participants said that its collection was considered

men's work until a woman in the group exclaimed that she is the collector of birch bark in her family. There was consensus in every village, however, that firewood collection was exclusively men's work.

In Nebdeno, when questioned about the role of gender in NTFP collection one participant said,

> "Not all women can row a boat across the river. For this reason, men are also necessary."

The other respondents replied that gender was not a factor which determines who collects NTFPs. The participants agreed that everyone collects equally. Another participant said,

> "You can't say that either more men or more women collect. Everyone who wants to collects. Everyone who wants to, everyone who is able. And children, and women and men. They all go at the same time. Anyone who wants to earn some money works in this way."

In Griva, participants also agreed that gender did not play a role in who collects NTFPs. In answer to the question about which gender collects more, one respondent said,

> "Everyone. Everyone who isn't l...[lazy]. Everyone whoever needs the money right now. You see children and adults."

While focus groups in other villages concentrated on the questions asked by the researcher, the group in Griva would answer the questions but then begin focusing on contentious issues surrounding NTFP collection in their village. One of the main issues was the problem that arose out of payment methods used to compensate NTFP collectors. It was alleged, but vehemently denied, that some of the people accepting the harvest on behalf of NTFP companies traded alcohol for the NTFPs. This was an explosive allegation made in conjunction with pleas from some focus group participants to other participants to stop this practice.

In Pomosdino, the women felt that they collect more than the men. The men in the group agreed but said that this did not apply to them personally. The women claimed that they tend to collect more bilberries because they are more difficult to collect. Another woman in the group said,

> "Yes, yes. But fundamentally, men collect – they like to collect – lingonberries and also cloudberries. Cloudberry collection is considered purely men's work. In our family since childhood my father, brother and right now, come to think of it, my husband. Cloudberries and lingonberries are collected by them."

However, when asked about the role of gender in mushroom collection participants said that equal numbers of men and women collect. A woman in the group said that she liked to collect moss and lichen as well. Another man claimed that 70-75% of those in the forest were men. However, a female respondent said that the gender roles in each family

were different and specific to that family. She claimed that in her family she collects significantly more lingonberries than her husband does.

In Shoshka, a man in the group started by saying that he thought women participate more in NTFP collection. A female participant said that it depends on what is being collected, citing the example that firewood collection is exclusively a male task. One man said that berries were collected primarily by women but another man in the group contradicted him, saying that men also collect berries. A male respondent also claimed that mushrooms are collected more by men. One woman claimed that it is the men who collect moss for construction but another woman said that she collects moss as well. Yet another woman said that children collect moss as well and that, furthermore, children like to go collecting NTFPs in general. In the end, focus group participants seemed to approach the role of gender in NTFP collection from a perspective informed by their personal experiences.

Although not questioned about the role of age directly, participants in each focus group mentioned children as active collectors of NTFPs. The elderly were also mentioned as active collectors. In Shoshka, for example, one participant said,

> "...Many of the elderly go [collecting NTFPs]. They like to collect so they go. But their [physical] condition doesn't allow them to go far. Many are elderly."

Another recurring theme in the focus groups was that collecting NTFP was an activity that families participated in together as a unit.

The educational level and occupations of the focus group participants were recorded during the meetings. Based on this information, it was apparent that, overall, the majority of

the focus group participants had a technical level of education. However, despite their educational level, focus group participants were employed in occupations ranging from labourers, to semi-professional and/or technical workers, and professionals. The numbers of participants in these various occupational categories were approximately equal. There were also several pensioners among the focus group participants. In one focus group, one participant was illiterate while, another in the same group was a medical doctor who had attended university for many years. Similarly, in another village one participant was the mayor of the village, while some of the others in the group were a museum curator, a janitor, and a secretary.

The number of people living in the households of focus group participants was also recorded. The average number of people in each household was between three and four with a minimum number of one and a maximum number of six. These results were in keeping with census data for the entire population of the Komi Republic.

The focus group participants were questioned about what role they thought income level had in affecting NTFP collection. In Kuratovo participants were emphatic when they said that income level does not affect collection. One participant said,

"The difference [in NTFP collection] is whether the people are lazy or not."

This was a sentiment that was repeated in the other villages as well. Again, when questioned about income and NTFP collection a participant in Nebdeno said,

"I'd like to say that mushrooms and berries are gathered not just by those who have more money or lots of money, or those whose families have sufficient incomes. Instead, first of all those who like to labour. Those who aren't lazy. There are, for example, families who lack finances, but nonetheless they don't go out into the forest..."

In Griva, while it was acknowledged that people in all income brackets collect, a distinction was made in that they do different things with what they collect. One participant said that while low income people might collect to sell NTFPs so that they could buy bread, middle income people collect NTFPs for household use and then sell the extra to raise money for big ticket items such as new televisions or refrigerators. Participants in Pomosdino reported that income had a similar effect on NTFP collection in their village. They said that, while everyone collects NTFPs, the poor collect for subsistence and sale. Wealthier households, on the other hand, collect for recreation and use what they collect to make culinary delicacies. One participant in Pomosdino said,

"Even people who are well off [collect]. Right? This is either a habit or maybe you can call it an illness... a person can't live without the forest. It's not necessary that a person is short of money, right? They have money."

When questioned about the role of income level, the same results were reported in Shoshka as well. Participants agreed that while everyone collects, what they do with the NTFPs differs depending on their income level.

The results regarding income level were similar among the villages. There was general agreement that while income level does not affect whether people collect NTFPs or not, it does affect what they do with the NTFPs and what motivates them to gather them in the first place. For example, in Kuratovo one participant stated that the poor are more likely to sell what they collect in order to survive, while in Pomosdino, a participant said that people with higher incomes collect for recreational reasons and to add a variety of delicacies to their tables.

One uniform and unanimous response from all of the focus groups was that ethnicity is not a factor that affects NTFP collection. When asked about the role of ethnicity in gathering, participants in every focus group invariably answered that people of all ethnic backgrounds were equally involved in NTFP collection.

Regardless of the village, a theme that kept recurring was the peoples' connection to the forest. In every village, focus group participants said that they collected for recreation, for spiritual rejuvenation and because it was in their blood. A female participant in Pomosdino said that during the previous two to three years collecting NTFPs had become even more popular because of articles that began appearing in newspapers and magazines. According to her, articles explaining different uses for medicinal herbs and recipes using wild harvested foods have increased the popularity of collecting and using various NTFPs. Another issue that kept arising throughout the focus group meeting in Griva was concern over ecological health of the NTFP resource. Many were concerned that unsound harvesting practices were permanently damaging NTFP collection sites.

5.2 Quantitative Results

5.2.1 Descriptive Statistics

Quantitative data analysis was done in order to address the research objectives and test the hypotheses stated in Chapter 1, Section 1.1. The survey data were analyzed and descriptive statistics were used to present the results prior to further analyses using contingency tables, chi-square tests and logistic regression. Table 9 presents the approximate populations of each of the study villages as reported in the summer of 2005. A summary of the sample sizes, survey response rates and the number and percentage of respondents who collect NTFPs, as well as the number of those who do not collect, are presented by village in Table 11. In each village, 25% of households (every 4th listing in the village directory) were sampled. However, response rates varied with the lowest being in Pomosdino (21.9%) and the highest in Shoshka (76.6%) (see Table 10).

Table 9. Approximate village populations, summer 2005.

Village	Population
Kuratovo	1183
Nebdeno	498
Pomosdino	1377
Griva	465
Shoshka	513

Table 10. Summary of response rates and NTFP collection.

Village	Number of Households Surveyed	Number of Responses	Response Rate (%)	Collect	% Collectors	Do not collect
Nebdeno	52	20	38.5	18	90	2
Griva	42	17	40.5	15	88	2
Shoshka	47	36	76.6	31	86	5
Pomosdino	105	23	21.9	23	100	0
Kuratovo	92	49	53.3	44	90	5
Total	338	145	42.9	131	90	14

Descriptive statistics, illustrating the socioeconomic conditions within the study villages were compiled from the surveys and are presented in Tables 11 to 16.

Table 11. Gender profiles of the villages.

Village	Sample Size	# of Women	# of Men	% Women	% Men
Nebdeno	20	15	5	75	25
Griva	17	10	7	59	41
Shoshka	36	20	16	56	44
Pomosdino	23	16	7	70	30
Kuratovo	49	28	21	57	43
Total	145	89	56	61	39

Table 12. Age profiles of the villages.

Village	Mean	Median	Mode	Minimum	Maximum
Nebdeno	51	51	33	32	75
Griva	50	45	32, 42	32	78
Shoshka	51	46	46	24	82
Pomosdino	44	41	39	19	76
Kuratovo	49	45	42	22	92
Total	49	46	42	19	92

For the purposes of this study, the educational levels of respondents were split into four categories in the following way. Those respondents who did not complete the first nine years of compulsory education were placed in the "elementary" category. Those who completed either the nine years required for basic education, or 11 years for a complete high school diploma, were placed in the "high school" category. Respondents who received non-university post secondary education were categorized as "technical" and those who attended university were placed in the "university" category. Table 13 summarizes the descriptive statistics relating to educational level.

Table 13. Educational profiles of the villages.

Village	Median Educational Level	Educational Level (% Respondents)*			
		Elementary	High School	Technical	University
Nebdeno	Technical	20	20	35	10
Griva	Technical	18	24	47	0
Shoshka	High school	31	22	36	11
Pomosdino	Technical	4	26	52	17
Kuratovo	High school	20	22	29	12
Total	Technical	20	23	37	10

*Note: Some respondents did not report their level of education.

Occupational categories in the villages were varied. In order to simplify data analysis, occupations were placed into one of five categories. The categories are unemployed, pensioner or disabled, labour, technical/semi-professional, and professional. Table 14 provides a summary of the occupations within each category and Table 15 provides descriptive statistics relating to occupation.

Table 14. Summary of occupations by category.

Category	Occupation
unemployed	unemployed
pensioner or disabled	pensioner or disabled (previous occupations for both unknown)
labour	labourer
	farm tractor driver
	dairymaid
	farm worker
	packer
	stoker
	boilerman
	security guard
	janitor
	forest worker
	cook
	vendor
	driver
semi-professional/technical	daycare worker
	social worker
	paramedic
	lab tech
	technician
	cultural centre
	postal worker
professional	teacher
	physician
	nurse
	veterinarian
	businessman
	accountant
	journalist
	insurance agent
	director/manager
	communications
	economist
	student

Table 15. Occupation categories in the villages.

Village	Modal Category	Occupations (% Respondents)				
		Unemployed	Pensioner/ Disabled	Labour	Technical/ Semi-professional	Professional
Nebdeno	Pensioner or Disabled	10	45	15	10	5
Griva	Pensioner or Disabled	18	35	18	12	12
Shoshka	Pensioner or Disabled	14	42	22	6	17
Pomosdino	Professional	7	17	17	9	43
Kuratovo	Pensioner or Disabled	22	37	10	6	16
Total	Pensioner or Disabled	16	36	16	8	19

Table 16. Number of people in each household by village.

Village	Mean	Median	Mode	Minimum	Maximum
Nebdeno	2.2	2	1	1	4
Griva	2.9	3	1	1	6
Shoshka	2.6	2	1	1	6
Pomosdino	3.2	3	2	1	6
Kuratovo	2.4	2	1	1	5
Total	2.6	2	1	1	6

Table 17. Individual income categories in the villages.

Village	Mean	Median	Mode
Nebdeno	1000-3000	1000-3000	1000-3000
Griva	1000-3000	1000-3000	1000-3000
Shoshka	1000-3000	1000-3000	1000-3000
Pomosdino	1000-3000	3000-6000	3000-6000
Kuratovo	1000-3000	1000-3000	1000-3000
Total	1000-3000	1000-3000	1000-3000

5.2.2 Contingency Tables and Chi-Square Tests

Once the descriptive statistics were compiled and presented, the survey data were analyzed using contingency tables (Appendix 4), chi-square tests and logistic regression. Contingency tables were constructed and chi-square tests were conducted in order to examine the associations between the collection of eight major NTFPs (Table 8), six socioeconomic factors (Table 7) and villages. The data were also analyzed to test the hypotheses that in the Komi Republic women collect NTFPs for different reasons than men and that in the Komi Republic women use NTFPs in the household differently than men (hypotheses 8 and 9, Chapter 1, Section 1.1). For each NTFP, logistic regression was used to predict group membership (Tabachnick and Fidell, 2007) with the groups being those who collect NTFPs and those who do not collect NTFPs. The logistic regression analysis indicated which socioeconomic factors had an effect on the collection of each NTFP (Tables 24-31).

The relationships between the eight major NTFPs and each village were examined. A chi-square test indicated that there were no significant differences in collection among the

villages for seven of the eight NTFPs (Table 18). However, there was a significant difference among the villages in the number of respondents who collected birch bark. The Pearson's chi-square value for the relationship between birch bark collection and village was significant ($p < .05$). This means that the difference in the collection of birch bark among the villages was not due to chance. An examination of the contingency table for the villages and NTFPs, revealed that while 5.0 % of respondents in Nebdeno, 17.0% in Griva, 13.0% in Pomosdino and 28.6% of respondents in Kuratovo reported collecting birch bark, in Shoshka 41.7% of respondents reported collecting it (Appendix 4). The chi-square analysis was run again with the village Shoshka excluded and it was found that there was no significant difference in birch bark collection among the remaining four villages ($\chi^2 = 5.946$ and $p = .114$).

Table 18. Relationships between NTFPs and village.

NTFP	χ^2	p
Firewood	7.705	.103
Berries	2.775	.596
Mushrooms	2.889	.577
Medicinal Plants	0.187	.996
Birch Bark	12.231	.016*
Birch Sap	0.195	.996
Birch Boughs	0.977	.913
Chaga	4.329	.363

*Significance at $p < .05$

Table 19. Relationships between village and reason for collecting.

Reason	Village χ^2	p
Household use	3.519	.898
Sell commercially	8.957	.915
Sell privately	10.186	.857
Trade	12.251	.727
Gift	13.945	.603

*Significance at p <.05

Table 20. Relationships between village and household uses.

Reason	Village χ^2	p
Food	11.556	.482
Heating	12.399	.716
Medicine	16.646	.676
Forage	24.493	.434
Clothing	5.435	.710
Art	14.309	.815
Religion	22.120	.572

*Significance at p <.05

The Pearson chi-square values and significance levels for village and reasons for collection, and for village and household uses, are presented in Tables 19 and 20 respectively. There were no significant differences in reasons for collection or household uses among the village.

Next, the relationships between the NTFPs and the six socioeconomic factors were analyzed. The chi-square tests revealed that there was a significant difference in the collection of firewood, berries, birch bark and birch sap across educational levels (Table 21a). For these four NTFPs, the Pearson's chi-square value was significant ($p < .05$) which means that the different collection levels among education categories are not due to chance. Contingency Tables in Appendix 4 show that as educational levels increase, the collection of firewood, berries, birch bark and birch sap decreases. The Pearson's chi-square values and significance levels for all of the NTFPs and socioeconomic factors are presented in Table 21a and 21b.

Table 21a. Relationships between NTFPs, gender, age and education.

	Gender		Age		Education	
NTFP	χ^2	p	χ^2	p	χ^2	p
Firewood	0.231	.631	4.842	.564	10.862	.012*
Berries	0.294	.588	4.753	.576	12.952	.005*
Mushrooms	0.559	.455	10.373	.110	3.160	.368
Medicinal Plants	0.615	.433	6.569	.363	2.540	.468
Birch Bark	1.495	.221	4.143	.657	10.361	.016*
Birch Sap	2.486	.115	5.137	.526	11.722	.008*
Birch Boughs	0.130	.718	3.148	.790	0.476	.924
Chaga	2.077	.150	3.596	.731	0.533	.912

*Significance at $p < .05$

Table 21b. Relationships between NTFPS, occupation, household size and income.

NTFP	Occupation		Household Size		Income	
	χ^2	p	χ^2	p	χ^2	p
Firewood	2.409	.661	3.307	.653	2.593	.628
Berries	6.628	.157	1.525	.910	0.404	.982
Mushrooms	4.031	.402	2.335	.801	1.816	.770
Medicinal Plants	1.956	.744	1.843	.870	0.955	.916
Birch Bark	7.656	.105	11.878	.036*	1.993	.737
Birch Sap	8.357	.079	9.166	.103	3.399	.448
Birch Boughs	4.262	.372	0.335	.997	6.751	.150
Chaga	4.482	.345	1.949	.856	8.206	.084

*Significance at $p < .05$

Tables 22 and 23 present the chi-square values and significance levels for gender and reasons for collection and gender and household uses. There was a significant difference in the number of women and men who reported that the most important use of NTFPs was for food. Of the women, 86.1% cited NTFP use for food as most important, while 96.0% of men reported use for food as most important. Appendix 4 presents a complete contingency table for gender and the use of NTFPs for food. There were no other significant differences among women and men, the reasons they collect, and how they use NTFPs within the household.

Table 22. Relationships between gender and reason for collecting.

	Gender	
Reason	χ^2	p
Household use	2.953	.228
Sell commercially	4.645	.326
Sell privately	6.710	.152
Trade	3.929	.416
Gift	0.983	.912

*Significance at p <.05

Table 23. Relationships between gender and household uses.

	Gender	
Reason	χ^2	p
Food	8.351	.039*
Heating	6.542	.162
Medicine	7.198	.206
Forage	7.612	.268
Clothing	2.007	.367
Art	7.547	.183
Religion	5.771	.449

*Significance at p <.05

5.2.3 Logistic Regression

Once the contingency tables were created and chi-square tests conducted, logistic regressions were performed. Logistic regressions were used to predict the greatest likelihood of collecting each NTFP type. Table 24 summarizes the variables in the logistic regression

equation for firewood. The formulae beneath Table 24 demonstrate how the variables from the table are used to arrive at a value for $\hat{Y}$ (collect or do not collect) and the natural log of the probability of being in one group divided by the probability of being in the other group.

Table 24. Variables in the equation for firewood.

Full Model		B	S.E.	Wald	df	Sig.	Exp(B)
All villages				5.979	4	.201	
Nebdeno	(B_1)	.778	.774	1.010	1	.315	2.178
Griva	(B_2)	.508	.720	.497	1	.481	1.661
Shoshka	(B_3)	-.762	.533	2.041	1	.153	.467
Pomosdino	(B_4)	-.401	.619	.420	1	.517	.669
Female	(B_5)	-.633	.468	1.829	1	.176	.531
Age	(B_6)	-.060	.245	.059	1	.808	.942
Education	(B_7)	.917	.292	9.826	1	.002*	2.501
All occupations				4.002	4	.406	
Unemployed	(B_8)	.209	.711	.086	1	.769	1.232
Pensioner	(B_9)	1.654	.895	3.415	1	.065	5.227
Labour	(B_{10})	.142	.717	.039	1	.843	1.152
Technical	(B_{11})	.774	.927	.697	1	.404	2.169
Professional	(B_{12})	.106	.182	.336	1	.562	1.112
Income	(B_{13})	-.123	.191	.411	1	.522	.885
Constant	(A)	-1.512	1.722	.771	1	.380	.220

*Significance at p <.05

$$u = A + B_1X_1 + B_2X_2 + \ldots + B_kX_k \qquad [4]$$

$$= -1.512 + .778X_1 + .508X_2 - .762X_3 - .401X_4 - .633X_5 - .060X_6 + .917X_7 + .209X_8 + 1.654X_9 + .142X_{10} + .774X_{11} + .106X_{12} - 1.512X_{13}$$

$$\hat{Y}_i = \frac{e^u}{1 + e^u} \qquad [5]$$

$$\hat{Y}_i = \frac{e^{-1.512 + .778X_1 + .508X_2 - .762X_3 - .401X_4 - .633X_5 - .060X_6 + .917X_7 + .209X_8 + 1.654X_9 + .142X_{10} + .774X_{11} + .106X_{12} - 1.512X_{13}}}{1 + e^{-1.512 + .778X_1 + .508X_2 - .762X_3 - .401X_4 - .633X_5 - .060X_6 + .917X_7 + .209X_8 + 1.654X_9 + .142X_{10} + .774X_{11} + .106X_{12} - 1.512X_{13}}}$$

$$\ln\left(\frac{\hat{Y}}{1 - \hat{Y}}\right) = A + \Sigma B_jX_{ij} \qquad [6]$$

$$= -1.512 + .778X_1 + .508X_2 - .762X_3 - .401X_4 - .633X_5 - .060X_6 + .917X_7 + .209X_8 + 1.654X_9 + .142X_{10} + .774X_{11} + .106X_{12} - 1.512X_{13}$$

The use of these same formulae is repeated for berries, mushrooms, medicinal plants, birch bark, birch sap, birch boughs and chaga with the corresponding values for A, B_k, and X_k taken from Tables 25 to 31 below. The e^B, or Exp(B), value indicates the odds ratio. This value indicates the ratio of change in the odds of NTFP collection for a one-unit change in the particular predictor (Fayowski, 2006). For example, the odds of a person collecting firewood are 2.501 times greater as a result of a lower educational level. The Exp(B) values for each village and socioeconomic factor are listed in Tables 25 to 31 by NTFP. Note that there are anomalous S. E. values for the villages of Shoshka and Griva as well as labour and technical occupations in Table 31 for chaga. The researcher has not isolated the cause of these S. E. values.

Table 25. Variables in the equation for berries.

Full Model		B	S.E.	Wald	df	Sig.	Exp(B)
All villages				1.325	4	.857	
Nebdeno	(B_1)	-18.911	9439.471	.000	1	.998	.000
Griva	(B_2)	-1.047	1.346	.605	1	.437	.351
Shoshka	(B_3)	-.958	.951	1.017	1	.313	.383
Pomosdino	(B_4)	-.378	.909	.173	1	.677	.685
Female	(B_5)	-.695	.771	.813	1	.367	.499
Age	(B_6)	.933	.620	2.266	1	.132	2.543
Education	(B_7)	1.179	.651	3.277	1	.070	3.250
All occupations				3.615	4	.461	
Unemployed	(B_8)	.577	1.008	.328	1	.567	1.781
Pensioner	(B_9)	-2.895	1.801	2.584	1	.108	.055
Labour	(B_{10})	-.310	1.282	.059	1	.809	.733
Technical	(B_{11})	-.237	1.337	.031	1	.859	.789
Professional	(B_{12})	.146	.317	.213	1	.645	1.158
Income	(B_{13})	.543	.372	2.138	1	.144	1.722
Constant	(A)	-10.626	4.439	5.732	1	.017	.000

*Significance at $p < .05$

Table 26. Variables in the equation for mushrooms.

Full Model		B	S.E.	Wald	df	Sig.	Exp(B)
All villages				.900	4	.925	
Nebdeno	(B_1)	.420	.851	.243	1	.622	1.522
Griva	(B_2)	-.226	.960	.056	1	.814	.798
Shoshka	(B_3)	-.148	.749	.039	1	.843	.862
Pomosdino	(B_4)	.411	.776	.281	1	.596	1.509
Female	(B_5)	.261	.624	.175	1	.676	1.299
Age	(B_6)	.188	.330	.323	1	.570	1.206
Education	(B_7)	.296	.360	.674	1	.412	1.344
All occupations				1.689	4	.793	
Unemployed	(B_8)	.423	.924	.209	1	.647	1.526
Pensioner	(B_9)	.040	1.105	.001	1	.971	1.040
Labour	(B_{10})	.373	.948	.155	1	.694	1.452
Technical	(B_{11})	1.140	.967	1.390	1	.238	3.127
Professional	(B_{12})	.240	.228	1.110	1	.292	1.272
Income	(B_{13})	.092	.252	.132	1	.716	1.096
Constant	(A)	-4.922	2.352	4.379	1	.036	.007

*Significance at p <.05

Table 27. Variables in the equation for medicinal plants.

Full Model		B	S.E.	Wald	df	Sig.	Exp(B)
All villages				.394	4	.983	
Nebdeno	(B_1)	-.338	.665	.259	1	.611	.713
Griva	(B_2)	-.202	.681	.088	1	.766	.817
Shoshka	(B_3)	-.264	.526	.252	1	.616	.768
Pomosdino	(B_4)	-.252	.627	.162	1	.687	.777
Female	(B_5)	-.719	.476	2.280	1	.131	.487
Age	(B_6)	.351	.234	2.254	1	.133	1.421
Education	(B_7)	.318	.263	1.469	1	.226	1.375
All occupations				1.065	4	.900	
Unemployed	(B_8)	-.530	.720	.543	1	.461	.588
Pensioner	(B_9)	-.292	.836	.122	1	.727	.747
Labour	(B_{10})	.088	.729	.014	1	.904	1.092
Technical	(B_{11})	-.272	.854	.102	1	.750	.762
Professional	(B_{12})	.237	.181	1.712	1	.191	1.267
Income	(B_{13})	-.060	.188	.100	1	.752	.942
Constant	(A)	-1.382	1.635	.715	1	.398	.251

*Significance at p <.05

Table 28. Variables in the equation for birch bark.

Full Model		B	S.E.	Wald	df	Sig.	Exp(B)
All villages				7.812	4	.099	
Nebdeno	(B_1)	1.708	1.130	2.284	1	.131	5.520
Griva	(B_2)	1.050	.834	1.587	1	.208	2.858
Shoshka	(B_3)	-.397	.561	.501	1	.479	.672
Pomosdino	(B_4)	1.110	.801	1.922	1	.166	3.035
Female	(B_5)	-.096	.517	.034	1	.853	.908
Age	(B_6)	-.027	.282	.009	1	.925	.974
Education	(B_7)	1.126	.359	9.834	1	.002*	3.083
All occupations				4.038	4	.401	
Unemployed	(B_8)	-.304	.779	.152	1	.696	.738
Pensioner	(B_9)	1.075	1.065	1.018	1	.313	2.930
Labour	(B_{10})	.933	.887	1.105	1	.293	2.542
Technical	(B_{11})	1.354	1.232	1.209	1	.271	3.874
Professional	(B_{12})	-.409	.215	3.613	1	.057	.664
Income	(B_{13})	-.013	.222	.003	1	.954	.987
Constant	(A)	-1.151	1.991	.334	1	.563	.316

*Significance at $p < .05$

Table 29. Variables in the equation for birch sap.

Full Model		B	S.E.	Wald	df	Sig.	Exp(B)
All villages				1.636	4	.802	
Nebdeno	(B_1)	-.920	.941	.958	1	.328	.398
Griva	(B_2)	-.283	1.028	.076	1	.783	.754
Shoshka	(B_3)	-.238	.834	.082	1	.775	.788
Pomosdino	(B_4)	-.995	.969	1.054	1	.305	.370
Female	(B_5)	.010	.675	.000	1	.988	1.010
Age	(B_6)	.433	.316	1.879	1	.170	1.542
Education	(B_7)	1.094	.469	5.446	1	.020*	2.987
All occupations				3.403	4	.493	
Unemployed	(B_8)	-1.646	1.325	1.544	1	.214	.193
Pensioner	(B_9)	-.861	1.617	.283	1	.594	.423
Labour	(B_{10})	-.127	1.393	.008	1	.927	.881
Technical	(B_{11})	-.819	1.632	.252	1	.616	.441
Professional	(B_{12})	.055	.280	.039	1	.844	1.057
Income	(B_{13})	-.189	.286	.436	1	.509	.828
Constant	(A)	-.903	2.391	.143	1	.706	.405

*Significance at $p < .05$

Table 30. Variables in the equation for birch boughs.

Full Model		B	S.E.	Wald	df	Sig.	Exp(B)
All villages				.684	4	.953	
Nebdeno	(B_1)	.249	.712	.123	1	.726	1.283
Griva	(B_2)	.051	.713	.005	1	.943	1.052
Shoshka	(B_3)	.087	.534	.027	1	.870	1.091
Pomosdino	(B_4)	-.352	.627	.315	1	.574	.703
Female	(B_5)	.001	.462	.000	1	.998	1.001
Age	(B_6)	-.035	.246	.021	1	.886	.965
Education	(B_7)	-.096	.258	.139	1	.709	.908
All occupations				3.893	4	.421	
Unemployed	(B_8)	-.940	.738	1.621	1	.203	.391
Pensioner	(B_9)	-.830	.859	.935	1	.334	.436
Labour	(B_{10})	-.926	.736	1.585	1	.208	.396
Technical	(B_{11})	.840	1.191	.498	1	.480	2.317
Professional	(B_{12})	.033	.182	.032	1	.858	1.033
Income	(B_{13})	.243	.198	1.505	1	.220	1.275
Constant	(A)	1.051	1.714	.376	1	.540	2.861

*Significance at p <.05

Table 31. Variables in the equation for chaga.

Full Model		B	S.E.	Wald	df	Sig.	Exp(B)
All villages				1.941	4	.747	
Nebdeno	(B_1)	-.673	1.473	.209	1	.648	.510
Griva	(B_2)	18.893	9259.869	.000	1	.998	1.6E+008
Shoshka	(B_3)	19.361	5934.085	.000	1	.997	2.6E+008
Pomosdino	(B_4)	1.851	1.412	1.717	1	.190	6.363
Female	(B_5)	2.484	1.213	4.195	1	.041*	11.984
Age	(B_6)	-.199	.706	.079	1	.778	.820
Education	(B_7)	-.087	.718	.015	1	.903	.916
All occupations				1.467	4	.832	
Unemployed	(B_8)	2.163	1.804	1.437	1	.231	8.699
Pensioner	(B_9)	1.200	2.251	.284	1	.594	3.320
Labour	(B_{10})	19.915	6866.266	.000	1	.998	4.5E+008
Technical	(B_{11})	18.779	11175.092	.000	1	.999	1.4E+008
Professional	(B_{12})	-.308	.601	2.62	1	.609	.735
Income	(B_{13})	.230	.454	.256	1	.613	1.258
Constant	(A)	.851	4.646	.034	1	.855	2.343

*Significance at p <.05

For these analyses, only full models were used. That is, the village variable and all of the socioeconomic variables were included as predictors in the model. Additional models

were not created because there were no theoretical reasons upon which to base decisions about variable inclusion or order. Furthermore, the predictor variables for each model, or NTFP, had different significance levels.

The goodness-of-fit statistic was examined for each model to determine if the model adequately describes the data. As recommended by Tabachnick and Fidell (2007), the Hosmer-Lemeshow test for goodness-of-fit was used for this purpose. For this test, a significance value greater than .05 indicates a good fit. The results of this test indicated that the model explains the variance in the dependent variable to a significant degree (Garson, 2006) for all of the NTFPs except mushrooms. The results of the Hosmer-Lemshow test are reported for each model, labelled by NTFP, in Table 32 below.

Table 32. Hosmer and Lemeshow test summary by NTFP.

Model	Chi-square	df	Sig
Firewood	9.242	8	.322
Berries	5.213	8	.735
Mushrooms	16.791	8	.032*
Medicinal Plants	7.967	8	.437
Birch Bark	14.245	8	.076
Birch Sap	7.468	8	.487
Birch Boughs	5.399	8	.714
Chaga	2.658	8	.954

*Significance at $p < .05$

The Nagelkerke R Square, which is a value that falls between 0 and 1, was used to estimate the percent of variance explained by the model and can be considered a pseudo r-squared statistic (Fayowski, 2006). For example, in the firewood model, Nagelkerke R

Square = .217 which means that the variables in the model explain approximately 22% of the variation in firewood collection. Table 33 summarizes the Nagelkerke R Square values for the remaining models, which are identified by NTFP.

Table 33. Nagelkerke R Square summary by NTFP.

Model	Nagelkerke R Square	Approximate % of the Variation Explained by the Model
Firewood	.217	22
Berries	.306	31
Mushrooms	.083	8
Medicinal Plants	.082	8
Birch Bark	.308	31
Birch Sap	.227	23
Birch Boughs	.069	7
Chaga	.954	95

The general purpose of the logistic regression models is to provide a method of predicting NTFP collection. Expressed as percentages, Table 34 summarizes how often the models correctly predict collection and non-collection of the NTFPs. In reviewing how often the models made correct predictions overall, the lowest score was for firewood (69.8%) and the highest was for chaga (96.8%). That is to say, that the models were correct in their predictions between 69.8% of the time and 96.8% of the time depending on the NTFP type.

Table 34. Summary of model prediction.

Model	Prediction of Collection (%)	Prediction of Non-Collection (%)	Overall Prediction (%)
Firewood	52.0	81.6	69.8
Berries	99.1	0	90.5
Mushrooms	100.0	0	85.7
Medicinal Plants	16.3	94.0	67.5
Birch Bark	42.9	92.3	78.6
Birch Sap	5.9	98.2	85.7
Birch Boughs	2.6	97.7	69.0
Chaga	33.3	100.0	96.8

5.3 Discussion

Both the qualitative and quantitative results indicated that, of the socioeconomic factors being studied, village, gender, educational level, and household size, had an effect on the collection of some NTFPs. Of the factors that did have an effect on collection, village as a factor (independent variable), only affected the collection of birch bark in Shoshka. Gender affected firewood and chaga collection, as well as which household use of NTFPs people considered to be the most important. Educational level affected the collection of firewood, berries, birch bark and birch sap, while the household size affected the collection of birch bark. The age, ethnicity, occupation and income level of NTFP gatherers did not have a significant effect on NTFP collection. Additional, but unexpected, factors that had a significant effect on collection were culture and alcoholism. Culture and alcoholism were

two unexpected factors that emerged from the qualitative data and were found to affect the collection of all NTFPs.

Following is a detailed discussion of each socioeconomic factor, its specific effect on NTFP collection, as well as the role of gender in the reasons for collection and household uses of NTFPs.

5.3.1 Gender

One of the objectives of this study was to assess the existing socioeconomic profile in the Komi Republic. For each of the five villages that were visited, data were collected on gender, age, educational level, occupation, household size and income level. Statistical data gathered by the Government Statistical Service of the Russian Federation, for the Komi Republic, was also examined. When the two sets of data were compared, similar trends were observed.

The results of the surveys showed that 61% of respondents were women and 39% were men (Table 11). According to official Russian census data for the Komi Republic, 52.2% of the population are women while 47.8% are men (Bazhenova, 2005). Although the survey data collected in this study indicate a much wider gap in gender distribution, the trend is the same as that in the official census data. The disproportion in the number of women compared to the number of men appears to be linked to differences in mortality between the genders. According to the World Health Organization (2006), the average life expectancy for men in Russia was only 59 years in 2004, while for women it was 72. Based on

observations of village life in the Komi Republic, it is suspected that the difference in the numbers of men and women is partially due to the social conditions in the villages.

During a walk through Kuratovo, the researcher caught up with a middle-aged woman who was a resident of the village and struck up a conversation with her. During the course of the conversation, the woman gave her perspective on what she felt had led to the difficult socioeconomic situation in the villages. According to her, during the social and economic restructuring that occurred in the early 1990s, many traditionally male dominated jobs disappeared from the villages. Collective farms, forestry operations and other primary industries were closed. As a result, some men left the villages to seek work in the cities. Others remained in the villages and many of them succumbed to alcoholism which often results in death at a relatively young age. This observation is somewhat supported by Morozova (2001, pg. 181) who wrote:

> Destructive social processes in rural areas led to the emergence of some social groups who found themselves in irreversible social exclusion. These are primarily people who lost their jobs when their enterprise was shut down or reorganized. According to our data they account for up to 50% of the unemployed.

As the research for this study was being conducted, there were several alcohol related deaths of village men in their mid-forties. This observation correlates with population statistics presented in Figure 10. There are generally more males than females in age categories below 45 years (Figure 10). In the 45-49 year-old category the trend reverses and there are significantly fewer men than women in subsequent age categories (Figure 10).

The hypothesis that, in the Komi Republic, NTFP collection is affected by gender was supported in the case of firewood and chaga, but it was not supported with respect to other NTFPs. The qualitative and quantitative (Table 31) results indicate that gender affects the collection of chaga and that it is generally the men who collect it. A hot drink made from chaga is the preferred drink of hunters (men) who live off the land for several weeks at a time at regular intervals. The hunters use chaga as a substitute for tea during these excursions. Some women also collect and use chaga. However, since women generally do not hunt, their collection and use of chaga is different from that of men. Unlike men who primarily use chaga as a tea substitute, women use it as a medicine and health tonic.

The role of gender in berry and mushroom collection is also not entirely clear. Focus group participants in several villages initially stated that women tend to collect more berries and men tend to collect more mushrooms. Further discussions within the groups generally led to the agreement that both women and men collect berries and mushrooms with equal frequency. Since it was common for people to collect NTFPs together as family units, it is most likely that the debates over the role of gender in berry and mushroom collection apply to quantity rather than frequency.

Both men and women in the Komi Republic collect NTFPs. However, while the quantitative data did not reveal any significant differences in firewood collection, the qualitative data did indicate that gender does affect firewood collection. Both women (37%) and men (41%) reported collecting firewood in the questionnaires. However, observations, interviews and focus groups indicated that firewood collection is an activity almost exclusively dominated by men. One possible explanation for the discrepancy between the qualitative and quantitative data is that it is due to the Komi Republic's communist past.

People are used to thinking in terms of the collective, and even when they are clearly asked to fill out the questionnaire as individuals, people still approached it from a household perspective. The fact that in the Komi Republic, NTFPs tend to be used by all the members of a household, regardless of which household member did the collection, could also have contributed to the way in which respondents approached filling out the questionnaires. For example, because everyone in a household benefits from the use of firewood, when a respondent was asked if he or she collects firewood, that individual said "yes" even though he or she was not the one who had collected the firewood. Both qualitative and quantitative results indicate that gender did not generally appear to be a significant factor affecting NTFP collection.

5.3.2 Age

Overall, according to official statistics, the highest proportion to the population, for both genders, is in the 15-19, 40-44 and 45-49 year-old categories (Figure 10). The quantitative methods used in this study only surveyed adults over the age of 19. The results indicate that as in the official census data, the mean and median ages of the people in the study villages ranged from 44 to 51 (Table 12).

The hypothesis that, in the Komi Republic, NTFP collection is affected by age was not supported. Both qualitative and quantitative results indicated that age does not play a significant role in NTFP collection. People tend to collect together as family units and everyone, from young children to senior elders, collects NTFPs in the Komi villages studied.

5.3.3 Educational Level

Russia is well known for the accessibility of its educational system and the corresponding high levels of education within its population. This is evident in the literacy rate which is 99.4% for people over age 15 (UNDP, 2006). The survey results in this study indicated that the median level of education for all of the villages combined was at the technical level (Table 13). Individually, the median educational level in Shoshka and Kuratovo was high school while in Pomosdino, Griva and Nebdeno it was at the technical level (Table 13).

The hypothesis that, in the Komi Republic, NTFP collection is affected by educational level was supported. The quantitative data indicated that as educational level increased, NTFP collection decreased for several types of NTFPs. This trend was observed for firewood, berries, birch bark and birch sap. The trend, however, did not appear to be linked with occupation types and it is unclear why it exists. Furthermore, there were no qualitative results regarding educational level and NTFP collection. This is because it is difficult to determine research participants' educational level based purely on observations. More research is needed to determine why educational level affects NTFP collection in the Komi Republic.

5.3.4 Occupational Type

According to the official census data, the most important sectors in the regions studied are industry, education, agriculture and health (Figures 11 to 16). The other less

dominant sectors, listed according to their general level of importance to the regions, are administration, housing, construction, retail trade, art and culture, communications, transportation, and finance.

The quantitative surveys indicated that the majority of people living in the villages are either not in the workforce and collect either old age or disability pension (Table 15). The second most common occupation category within the villages is professional, then labourer and finally technical. Table 14 lists how occupations were categorized for the purposes of this study.

The hypothesis that, in the Komi Republic, NTFP collection is affected by occupational type was not supported. Both quantitative and qualitative results indicated that occupation is not a factor that affects NTFP collection. This is an interesting result, when compared with the finding that educational level is a factor that does affect NTFP collection. Other studies (de Grip et al., 1991; Alam, 1990) have shown that these two factors often co-vary, however, that does not appear to be the case in this study. This may be because there are a large number of pensioners in the study and their former occupations were not recorded.

5.3.5 Household Size

According to the official census data for the rural population of the Komi Republic, the percentages of households with 2, 3, 4 and >5 people living in them are 35.4%, 30.4%, 22.6% and 11.5% respectively (Table 4), (FSDSKR, 2005). By region, the average numbers of people in each household are 2.6 for the Koigorodskii Region, 2.7 for the Kortkerosskii and Syktyvdinskii Regions, 2.5 for the Sysol'skii Region and 2.8 for the Ust'-Kulomskii

Region (Table 5). Table 5 further elaborates on the percentages of households consisting of 1, 2, 3, 4 and >5 people.

The survey data in this study indicate findings similar to those of the official census for the number of people per household (Table 16). The median number of people in each household in Nebdeno (Kortkerosskii Region), Shoshka (Syktyvdinskii Region) and Kuratovo (Sysol'skii Region) was 2. The median number of people in each household in Griva (Koigorodskii Region) and Pomosdino (Ust'-Kulomskii Region) was 3. According to the quantitative survey results of this study, the median number of people in each household seems to be related to median ages and occupation categories. In Pomosdino, the median number of people in each household is three (Table 16); the median age is the youngest of all the villages at 41 years (Table 12); and the percentage of people on old age or disability pensions is the lowest at 17% (Table 15). In Griva, the median number of people in each household is three (Table 16); the median age is the second youngest at 45 (Table 12); and the percentage of people on old age or disability pension is the second lowest at 35% (Table 15). This result is logical since it was observed that households with younger families were larger than those with retired seniors. Overall, the mode, or most common number of people per household was 1 and the maximum number of people per household was 6 (Table 16).

A comparison between household size and birch bark collection indicated that these two variables were related. However, when the percentages of people who collect birch bark were calculated for each household size, no clear trend was revealed. In households with one person, 21% collect birch bark; in households with 2 people, 25% collect; in household with 3 people, 10% collect; in household with 4 people, people, 46% collect; in household with 5 people, 12% collect; and for households with 6 people, 40% collect birch bark. In the

absence of a trend, even though there appears to be a relationship between household size and birch bark collection, it is difficult to determine what that difference is or why it exists.

Although there were no significant differences among the villages for the collection of other NTFPs, there was a significant difference in the percentage of people who reported collecting birch bark among the villages. This difference did not appear to be connected with availability, since birch is a species that is ubiquitous in the Komi Republic. The rate of birch bark collection ranged from a minimum of 5.0 % of respondents in Nebdeno to 41.7% of respondents in Shoshka. This difference in birch bark collection could be due to the differences in sample sizes among the villages. In Nebdeno only 38.6% of those surveyed responded while in Shoshka that number was 76.6%. There was no observable reason for this difference in birch bark collection. The study villages were similar in size, had the same types of houses (i.e., heated using firewood, and birch bark for fire starter), had similar surrounding ecology and abundance of birch, and similar socioeconomic profiles.

If the data for Shoshka are removed, there are no longer any differences in collection patterns among the villages. There is also no difference in the pattern of birch bark collection by household size. With Shoshka removed from the data set, of households with one person in them 12% collect birch bark; in households with 2 people, 22% collect; in household with 3 people, 5% collect; in household with 4 people, people, 45% collect; in household with 5 people, 14% collect; but for households with 6 people, 0% collected birch bark. With the exception of households with 1 person and households with 6 people, there is no notable difference in collection patterns among the other household sizes.

The hypothesis that, in the Komi Republic, NTFP collection is affected by household size was not supported. The qualitative results indicated that there was no observable

difference in birch bark collection among the villages. It should be noted as well, that neither the logistic regression nor the qualitative data indicated that the household size affected the collection of birch bark or any other NTFP. Again, if the village of Shoshka is removed from the quantitative analysis of village and NTFP type, there is no longer a difference in collection patterns among the villages. However, if Shoshka is kept in the analysis, the quantitative results do not support the findings reported in the qualitative results.

5.3.6 Income

While the average monthly wages for each region of the Republic range from 3710 rubles to 4490 rubles (Table 8), the survey data indicate lower incomes in the study villages. This is logical since the averages by region include urban and industrial centres whereas the data collected in this study came strictly from small villages with populations that range from 513 to 1377 people (Table 9).

According to the survey, the mean income in the study villages is between 1000 and 3000 rubles per month (Table 17). Few respondents gave an exact income when filling out the questionnaires but for those who did, the average income was approximately 3100 and the median income was 3000 rubles per month.

To put wages in perspective, the following is a brief snapshot of prices for common NTFPs during the summer of 2005. A loaf of bread cost between 10 and 25 roubles per loaf. A litre of milk was about 15 to 20 roubles. The price for an average sized television was from 1000 to 5000 roubles, refrigerators generally cost 5000 to 7000 roubles, washing machines were 5000 to 15 000 roubles. Finally, passenger automobiles were sold for

between 300 000 and 500 000 roubles. For further perspective, during the summer of 2005 the one Canadian dollar could be exchanged for approximately 22 Russian roubles.

The hypothesis that, in the Komi Republic, NTFP collection is affected by income level was not supported. Results from both the quantitative and qualitative methods indicate that income is not a factor that affects NTFP collection. Contingency tables, chi-square tests and logistic regressions indicated that income level is not a factor that significantly affects NTFP collection. Participant observation, focus group and informal interview results also indicate that income level is not a factor that affects NTFP collection in the Komi Republic.

5.3.7 Other Factors

While six main socioeconomic factors were examined in this study, open-ended questions were used in the questionnaires, focus groups, and informal interviews in order to provide an opportunity for other factors to emerge. Two such unanticipated factors were identified in both the qualitative and qualitative data. One of these factors was the deeply entrenched cultural tradition of NTFP collection, the other was alcoholism.

When asked why they collect NTFPs people responded by saying that they did so because they were trained to it as children; that it is a habit; that they are addicted to collecting; that it is impossible not to collect; and because they love going out into the forest. When asked what sort of people do not collect respondents invariably answered that only lazy people do not collect NTFPs. These responses indicate the role NTFP collection plays in the culture of Komi villages.

The importance of NTFPs to Komi culture was further confirmed by observations of NTFPs being used in every household that was visited by the researcher. Non-timber forest products used for food, medicine, art, household utensils, bathing, heating, and spiritual practices were observed in every village household without exception. Furthermore, these same NTFPs were also observed in city households as well.

The second unanticipated factor revealed in this study was alcoholism. The qualitative data from both the observations and focus groups indicated that there is widespread alcoholism in the villages. An indication of alcoholism was also inadvertently picked up in the quantitative surveys. In one village, a 37-year-old unemployed man filled out a questionnaire responding to questions about his NTFP collection habits. He also added a personal note on the first page of the questionnaire requesting medical assistance to help him cope with his alcoholism.

In a different village, another unemployed man in his forties, also known by locals to be suffering from alcoholism, was clearly intoxicated when he hand-delivered his questionnaire to the researcher. Although alcoholism and its effect on the village population of the Komi Republic are outside the scope of this study, it is a social factor that potentially plays a role in gender distribution and also appears to affect NTFP collection.

Because alcoholism is such a widespread problem in the villages, it is impossible to ignore. The issue of alcoholism kept surfacing as data collection was being carried out. For example, Vladimir Valentinovich Popov, Manager of Matreko Kholod's NTFP processing plant in Syktyvkar, was interviewed and asked what factors he felt affected NTFP collection. Specifically, he was asked what segment of the population was the most active in NTFP collection. Vladimir Valentinovich explained that industrious families who own vehicles and

are financially relatively well off collect the most. He also said that contrary to popular belief, people suffering from alcoholism collect very little. In his words,

> "Many people come to the following conclusions. Look at the statistics, there are a lot of unemployed people – this is not a secret. The question arises in people's minds. They wonder, "If a region has a high unemployment rate, then these unemployed people, for some reason, must be [collecting] in the forest." For some reason people think this. But this is not true. There is no truth to this assumption."

He went on to say,

> "Roughly speaking, for example, a bottle of vodka costs about 30 rubles, a package of cigarettes is about 5 and a can of some sort of preserve costs about 15 rubles. A kilogram of mushrooms sells for about 40 roubles per kilogram. These people [suffering from alcoholism] they can do the calculations without any sort of weigh scale or anything. They go into the forest and collect exactly the amount of mushrooms they need to buy that bottle of vodka, package of cigarettes and can of preserved food. That's it! Without a scale without anything, he collects exactly what he needs to buy these things. That's it, his workday is done."

These statements are in line with those of Veniamin Petrovich and the focus group participants in Griva (See 5.1.1, 5.1.4 and 5.2.1).

The comments addressing alcoholism relate to the quantity of NTFPs collected but do not address the frequency with which those suffering from alcoholism collect. More study in needed to determine how alcoholism affects the frequency of NTFP collection.

5.3.8 Gender, Reasons for Collecting and Household Use

Finally, the hypothesis that women collect NTFPs for different reasons than men was not supported. Chi square tests indicated that gender does not affect the reasons why people collect NTFPs. Both men and women collect for the same reasons which, in order of importance are: household use, commercial sale, private sale, gifting and trade. The chi square test did indicate, however, that gender does affect how NTFPs are used in the household and the hypothesis that women and men use NTFPs differently in the household was supported. There was a significant difference in the number of women who consider the most important household use of NTFP to be for food compared to the number of men. While 86.1% of women reported that using NTFPs for food was most important, 96.0% of men reported use for food as most important. There was no significant difference between the genders with respect to other household uses. Listed in order of importance, these are heating, medicine, forage, art, and religious practices. Only one respondent indicated that he occasionally uses NTFPs for making clothing and one respondent indicated that he rarely uses NTFPs for making clothing.

It is not clear from the data why the discrepancy exists between the importance women and men place on the household use of NTFPs for food. Neither the qualitative nor quantitative data can explain this difference.

The qualitative data do indicate that household use, and in particular the use of NTFPs for food, were the most important reason and use of NTFPs respectively. When NTFP collection was discussed, the first NTFPs that people focused on were berries and mushrooms. Other NTFPs entered the conversations subsequent to probing questions from the researcher and further discussions among research participants. While the practice of selling NTFPs is fairly established in several villages (Griva, Nebdeno, Pomosdino), it is not so well established in other villages (Kuratovo, Shoshka). Furthermore, while there is more commercial NTFP activity in some villages, the majority of villagers still collect NTFPs primarily for household often selling only their excess.

Chapter Six
Conclusion and Recommendations

The results of this study contribute to the general understanding of the role of NTFPs in rural livelihoods in the Komi Republic. Russia is different from both developing and developed regions, yet the role NTFPs play in rural livelihoods in the Komi Republic is similar to their role in both developing and developed regions. People in the Komi Republic collect NTFPs for household subsistence, to supplement wage income, as a safety net during difficult economic times, for commercial sale, for cultural reasons and for recreation.

This study also revealed that in the Komi Republic, some socioeconomic factors affect NTFP collection, while others do not, and that the effects of socioeconomic factors on the collection of NTFPs vary depending on the NTFP being collected. Unlike the findings of research conducted in developing regions such as, the Western Ghats region of India (Rai and Uhl, 2004), southern Bengal (Sarin, 1995 in Bisong and Ajake, 2000), Sierra Leone (Lebbie and Guries, 2002), Nigeria (Bisong and Ajake, 2000; Egbule and Omolola, 2005), South Africa (Shackleton and Shackleton, 2004), Sri Lanka (Gunatilake, 1998), Cameroon (Brown and Lapuyade, 2001) or developed regions such as the Upper Peninsula of Michigan in the United States (Emery, 1999) the role of gender in NTFP collection in the Komi Republic was not entirely clear. While gender did appear to be a factor in the collection of firewood and chaga, it was not clear how gender affected berry and mushroom collection. The quantitative data also did not support the qualitative findings that gender does affect the collection of firewood. Although there is strong qualitative evidence that firewood collection is primarily a male dominated activity, the difference between the quantitative and qualitative results, requires further examination. While gender did not affect the reasons people collect

NTFPs, it did play a role in how men and women use NTFPs in the household. There was no indication as to why this is the case, and more study is needed to answer this question.

In contrast to developing regions such as southern Nigeria (Egbule and Omolola, 2005), the Brazilian Amazon (Pattanayak and Sills, 2001), Nameri National Park in Assam India (Chetery et al., 2003), and Sierra Leone (Lebbie and Guries, 2002), and developed regions such as the San Bernardino National Forest in the United States (Anderson et al., 2003), age was not a factor that affected NTFP collection in the Komi Republic.

Educational level was a factor that affected the collection of several NTFPs in the Komi Republic. As educational levels increased, the collection of firewood, berries, birch bark and birch sap decreased. A similar trend was reported in southern Nigeria (Egbule and Omolola, 2005), Sri Lanka (Gunatilake, 1998), and Sierra Leone (Lebbie and Guries, 2002). This result was the opposite of what was reported in developed regions, such as the San Bernardino National Forest in the United States, where NTFP collectors had higher than average levels of education (Anderson et al., 2003). Because a person's occupation, which is a common covariate with educational level (de Grip et al., 1991; Alam, 1990), did not affect NTFP collection in the Komi Republic, it is not clear why educational level had this effect. This is another area that requires further research.

Occupation is a factor that was found to affect NTFP collection in developing regions such as south-eastern Nigeria (Bisong and Ajake, 2000), southern Cameroon (Brown and Lapuyade, 2001), the Brazilian Amazon (Pattanayak and Sills, 2001), Sri Lanka (Gunatilake, 1998), the Peruvian Amazon (Coomes, 2004), and developed regions such as north-west Washington State and northern Idaho (Carroll et al., 2003) (see Section 2.3.4). In the Komi Republic, however, NTFP collection was not affected by occupational type.

In developing regions, such as the villages of Que and Ma in Vietnam, household size was a factor that affected NTFP collection (Quang and Anh, 2006). Household size was not a factor, however, in the collection of NTFPs in the Brazilian Amazon state of Rondonia (Summers et al., 2004). Studies that look at the effect of household size on NTFP collection in developed regions do not exist. In this study, a chi-square test revealed a relationship between birch bark collection and household size in one village in the Komi Republic. Upon closer examination, however, no clear trend was observed and the exact nature of the relationship between household size and birch bark collection was not clear. Other analysis methods (logistic regression, qualitative analysis) did not reveal a relationship between birch bark collection and household size. The general conclusion is that collection of other NTFPs in the Komi Republic is not affected by household size. This is, however, an area that requires more research.

It is generally thought that people with low income levels are most likely to collect NTFPs. However, as a factor, low income does not always indicate a greater inclination to collect NTFPs. Belcher et al. (2005) found that in 44% of the 61 cases they studied in Africa, Asia, and Latin America, NTFP gatherers had higher than average income levels. In the Komi Republic, income level did not appear to affect the collection of NTFPs. There is some indication that the quantity of NTFPs collected, and their use, may be affected by income level. However, more research must be conducted in order to fully investigate this observation.

Two unexpected finding of this study were that culture and alcoholism are factors that affect NTFP collection. While alcoholism was an unexpected factor, it is not a surprising one. There is some indication that alcoholism has a negative effect on the volume of NTFPs

collected, however, this study did not specifically examine the effects of alcoholism on the frequency of NTFP collection. There are many other questions that arise as a result of the recognition that alcoholism is a factor that affects NTFP collection. For example, what are the specific demographics associated with people who suffer from alcoholism? Are their NTFP collection patterns the same or different prior to their illness with this disease? These and other questions regarding the deeper role of alcoholism in NTFP collection remain, and require more study.

Culture plays a significant role in NTFP collection in the Komi Republic, and an entire study could be devoted to further investigating the role of this factor. Of all the factors studied, culture is the single most important one in this study. First, it is a factor that is universal in motivating people to collect all types of NTFPs in the Komi Republic. Second, NTFPs play an important role in the culture of the Komi Republic and are used in the food, art, domestic and spiritual practices of the Komi people on a regular basis. Culture, as the single most important factor that affects NTFP collection in the Komi Republic, warrants a more detailed, stand-alone study.

While some of the findings of this study may be generalized to other parts of Russia, this should be done with caution. When generalizing, attention should be given to the ecology of the region, and its socioeconomic similarities with the Komi Republic. Russia is a vast country and while many of its regions do have some common characteristics, such as large expanses of boreal forest and a generally common history, it remains an ethnically and geographically diverse nation. Hence, while some of the findings of this study may apply to other parts of Russia, others may be specific to the southern Komi Republic.

The objectives set out in this study have been achieved. The existing socioeconomic profile of the Komi Republic and the role of key socioeconomic factors in NTFP collection were assessed creating a baseline for future investigation, policy, and management initiatives. This study also added to the body of knowledge about the general role of NTFP collection in rural livelihoods, in the Komi Republic and Russia which is different from both developing and developed regions. However, despite the findings of this study, more research questions have been generated. The main recommendation of this study is that more work be done to gain a better understanding of the socioeconomic factors that affect NTFP collection in the Komi Republic, and Russia in general. This study demonstrated that NTFPs play a significant role in the lives and culture of people in the Komi Republic. Ultimately, the results of this study support the statement that, "NTFP collection, and the factors that affect it, are heavily influenced by geographic location and specific products being studied (Ros-Tonen and Wiersum, 2005)."

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Appendix 1

Berry, Mushroom, Herb, Shrub, Tree, Moss and Lichen Species Collected

Latin	**Common English**	**Common Russian (transliteration)**
Berries		
Lonicera edulis	Honeysuckle	Zhimlost'
Rubus saxatilis	Stone bramble	Kostianika
Fragaria vesca	Wild strawberry	Zemlianika
Oxycoccus palustris, O. microcarpus	Cranberry	Kliukva
Padus racemosa	Choke cherry	Cheremukha obyknovennaia
Ribes nigrum	Black currant	Chernaia smorodina
Ribes spicatum, R. hispidulum	Red currant	Krasnaia smorodina
Rosa acicularis	Wild rose	Shipovnik
Rosa canina	Rose hips	Shipovnik sobachii
Rosa cinnamomea	Rose hips	Shipovnik korichnyi
Rubus chamaemorus	Cloudberry	Moroshka
Rubus idaeus	Wild raspberry	Malina
Sorbus aucuparia	Mountain ash	Riabina obiknovennaia
Vaccinium myrtillus	Bilberry	Chernika
Vaccinium uliginosum	Blueberry	Golubika
Vaccinium vitis-idaea	Lingonberry	Brusnika
Viburnum opulus	High-bush cranberry	Kalina
Mushrooms		
Armillaria mellea	Honey mushroom	Openok osennii
Boletus edulis	Porcini, King Bolete	Belyi grib (elovyi)

Source: Russian Federation Ministry of Forests, unpublished list.

Latin	**Common English**	**Common Russian (transliteration)**
Boletus pinophilus	Spring King	Belyi grib (sosnovyi)
Cantharellus cibarius	Chanterelles	Lisichka
Gyromitra esculenta	Morel	Smorchok obyknovennyi
Inonotus obliquus	Sterile Conk Trunk Rot of Birch	Chaga
Ixocomus borinus	Clinker polypore, Charcoal shelf	Kozliak
Ixocomus luteus/Suillus luteus	Slippery Jack, Butter mushroom	Maslenok posdnii
Lactarius deliciosus	Saffron milk-cap	Ryzhik
Lactarius necator	Mutagen milk cap	Gruzd' chernyi
Lactarius pubescens	Bearded Milkcap	Belianka
Lactarius resimus	No English common name	Gruzd' nastoiashchii
Lactarius scrobiculatus	No English common name	Gruzd' zheltyi
Lactarius torminosus	No English common name	Volnushka rozovaia
Lactarius quietus	Oak milk-cap	Neitral'nyi mlechnik
Lactarius musteus	Pine milk-cap	Belyi mlechnik
Leccinum scabrum/Krombholzia scabra	Birch bolete	Podberezovik
Leccinum testaceoscabrum/Krombholzia aurantiara	Orange birch bolete	Podosinovik
Paxillus involutus	Common or brown roll-rim	Svinushka tonkaia (poisonous)
Russula azurea	No English common name	Syroezhka siniaia
Russula delica	No English common name	Podgrzdok belyi
Russula foetens	No English common name	Valui
Russula fragilis	Tacky green russula	Syroezhka lomkaia
Russula integra	No English common name	Syroezhka tsel'haia
Suillus variegates/Ixocomus variegatus	Yellowy-brown mossiness mushroom	Mokhavik maslenok zheltoburii
Tricholoma equestre	Man-on-horseback	Zelenushka (inedible)
Herbs		
Achillea millefolium	Yarrow	Tysiachelistnik

Source: Russian Federation Ministry of Forests, unpublished list.

Latin	Common English	Common Russian (transliteration)
Arctostaphylos uva-ursi	Kinnikinnick	Toloknyanka
Artemisia vulgaris	Wormwood	Polin' obyknovennyi
Bidens tripartita	Burr marigold	Chereda trekhrazel'naia
Calendula officinalis	Calendula	Nogotki lekarstvennye
Capsella bursa pastoris	Shepherd's purse	Pastus'ia sumka obyknovennaia
Carum carvi	Caraway	Tmin obyknovennyi
Chelidonium majus	Celandine	Chistotel bol'shoi
Epilobium sp.	Fireweed	Kiprii uzkolistnyi, Ivan chai
Equisetum arvense	Horse tail	Khvoshch
Hypericum perforatum, H. maculatum	St. John's Wort	Zveroboi
Inula helenium	Elecampagne	Devyacil
Leonurus cardiaca	Common motherwort	Pustyrnik piatilopastnyi
Matricaria recutita	German camomile	Romashka aptechnaia
Matricaria suaveolens	Common chamomile	Romashka
Mentha piperta	Pepermint	Miata perechnaia
Menyanthes trifoliata	Buck-bean	Vakhta trekhlistvennaia
Nuphar lutea	Yellow pond-lily	Kubyshka zheltaia
Origanum vulgare	Oregano	Dushitsa obyknovennaia
Plantago major	Broadleaf plantain	Podorozhnik bol'shoi
Polemonium caeruleum	Charity	Siniukha golubaia
Polygonum hydropiper	Marshpepper knotweed	Gorets perechnyi
Polygonum persicaria	Spotted ladysthumb	Gorets pochechuinyi
Rumex acetosa	Common sorrel	Shchavel'
Rumex confertus	Asiatic dock	Shchavel' konskii
Stellaria media	Common chickweed	Liagushchina
Tanacetum vulgare	Common tansy	Pizhma
Taraxacum officinele	Dandelion	Oduvanchik lekarstvennyi
Thymus serpyllum	Wild thyme	Tim'ian polzuchii

Source: Russian Federation Ministry of Forests, unpublished list.

Latin	**Common English**	**Common Russian (transliteration)**
Tussilago farfara	Colt's foot	Mat' i machekha
Urtica dioica	Nettles	Krapiva dvudomnaia
Valeriana officinalis	Valerian	Valeriana lekarstvennaia
Viola tricolor	Johnny jump-up	Fialka trekhtsvetnaia
Shrubs		
Alnus incana	Gray alder	Ol'kha seraia
Juniperus communis	Common juniper	Mozhzhevel'nik obyknovennyi
Ledum palustre	Wild rosemary	Bagulnik bolotnyi
Potentilla erecta	Tormentil	Kalgon, Lapchatka priamostoiachaia
Trees		
Abies sibirica	Fir	Pikhta
Betula pubescens, B. pendula, B. tortuosa	Birch	Bereza
Larix sibirica	Larch	Listvenitsa
Picea obovata, P. abies	Spruce	El'
Pinus sibirica	Siberian cedar, kedr	Kedr sibirskii
Pinus sylvestris	Scots pine	Sosna
Populus nigra	Black poplar	Topol'
Populus tremula	Aspen	Asina
Tilia cordata	Linden	Lipa melkolistovennaia

Source: Russian Federation Ministry of Forests, unpublished list.

Latin	Common English	Common Russian (transliteration)
Moss		
Polytricum communea	Polytricum moss	Zelenyi mokh
Sphagnum sp.	Sphagnum moss	Sfagnum
Lichens		
Cladonia stellaris	Reindeer lichen	Lishainiki

Source: Russian Federation Ministry of Forests, unpublished list.

Appendix 2
Focus Group Participants and Questions

Note: Occupations are not listed in the same order as participant names and therefore do not necessarily correspond.

Village #1: Kuratovo
Venue: Senior's institution
Date: Monday May 16, 2005
Time: 3:00pm

Participants:
Valentina Vasil'evna Kinova
Elena Vital'evna Kolegova
Anna Ivanovna Iugova
Olga Borisovna Chugaeva
Idris Akhmed-ogly Mogamedov

Occupations:
Senior's Home Director
Social Worker
Medical Doctor
Shop Keeper
Farmer

Village #2: Nebdeno
Venue: Village Museum
Date: Friday June 3, 2005
Time: 3:00pm

Participants:
Valerei Vladimerich Savin
Vera Vasil'evna Latkina
Galina Genad'evna Mikusheva
Elena Vasil'evna Anufrievna
Olga Ivanovna Makarova

Occupations:
Mayor
Janitor
Museum Curator
Teacher
Office Administrator

Village #3: Pomosdino
Venue: Youth Centre
Date: Wednesday, June 15 2005
Time: 6:00pm

Participants:
Nagezhda Borisovna Lodygina
Nikolai Afanas'evich Shebrov
Alexei Ivanovich Uzhitskii
Olga Egorovna Pashina
Svetlana Ivanovna Popova
Nina Evlogievna Sheveleva
Iul'ia Vladimirovna Rogozhnikova

Occupations:
Nurse
Pensioner
Deputy Mayor
Teacher
Teacher
Director of Supplementary Education
Teacher

Village #4: Griva
Venue: Village Administration Office
Date: Wednesday, July 6 2005
Time: 2:00pm

Participants:
Tamara Andreevna Teven'kova
Alexander Alexeevich Kalikov
Maria Gelesovna Karmanovna
Liudmila Sergeevna Igoshina
Liubov Vasil'evna Matveevna
Nadezhda Iur'evna Nechaeva
Olga Ivanovna Nechaeva
Liubov' Iaroslavovna Chugaeva
Nadezhda Alexandrovna Melnik
Lidiia Nikolaevna Koksharova
Nina Afanas'evna Shalashneva

Occupations:
Film engineer
Unemployed
NTFP Collector for Cooperative (Alpha)
Veterinary Assistant
Newspaper Journalist
Daycare Supervisor
Disabled
Director of Cooperative (Alpha)
Pensioner
Teacher
Pensioner

Village #5: Shoshka
Venue: Village Administration Office
Date: Wednesday, July 18 2005
Time: 4:00pm

Participants:
Mikhail Alexeevich Rassykhaev
Mikhail Alexeevich Kuz'min
Alexander Vasil'evich Rochev
Alexander Veniaminovich Konatov
Olga Sergeevna Anisimova
Svetlana Alexandrovna El'kina
Olga Sergeevna Anisimova

Occupations:
Gas-line Technician
Driver
Dispatcher
Construction Worker
Office Administrator
Office Administrator
Teacher

Focus Group Questions

The following questions were asked of participants in each focus group meeting:

1. What do you gather?
2. Why do you gather?
3. Who gathers NTFPs?
4. Does gender matter in the collection of NTFPs?
5. Does ethnicity matter in the collection of NTFPs?
6. Does a family's income level matter in the collection of NTFPs?
7. How far do you travel to collect NTFPs?
8. Are there other factors that affect NTFP collection?
9. What is the most important factor that affects NTFP collection?

Appendix 3

Sample Consent Forms and Questionnaires in both English and Russian

Consent to assist in the research of M. Sherstobitoff on the subject of "Socioeconomic factors affecting collection of non-timber forest products in the Komi Republic, Russia"

This statement of voluntary consent is limited to an agreement between M. Sherstobitoff, a student of the University of Northern British Columbia (Canada), and (your name)
_____.

Description of the Consent:

The purpose of this study titled, "Socioeconomic factors affecting collection of non-timber forest products in the Komi Republic, Russia", is to study the details of the collection and uses of non-timber forest products (for example: berries, mushrooms, birch bark, etc.) in the Komi Republic. The study also plans to investigate who collects non-timber forest products in the Komi Republic and why they collect. The information collected during this study will be used to write a Masters thesis which is required for the completion of a Master of Science degree in Forestry at the University of Northern British Columbia (Canada).

You, _____, were selected for this study using a systematic sample in which your household was chosen by chance from_____.

Conditions of Consent:

You may grant your voluntary consent either in writing or orally. This consent concerns only the information you present on the subject of this study. You can end your participation in this study, and/or withdraw information you have already presented, at any time. All of the information that you present, either in written or oral form, is confidential and will only be used for the purposes of this academic study.

Your participation in this study can be noted in the final Masters thesis or, if you so wish, your name will not be mentioned. Please indicate your preference.

Data from the audio recordings of the information you present will only be used by the researcher (M. Sherstobitoff) and immediate academic supervisors for the purposes of preparing:

- scientific papers and the final Masters thesis on this research topic;
- scientific and popular publications for the purposes of presenting and disseminating the results of this research;
- reports, public presentations, displays, and internet communications, dedicated to disseminating the results of this research.

Other scientists and researchers who may be interested in the collection of non-timber forest products in the Komi Republic will not be allowed to use the written or audio recorded information you provide. The audio recordings and transcripts will be kept for five years after the conclusion of this Masters thesis research. These materials will be kept in a secure location at the Syktyvkar State University while research activities are being conducted in the Komi Republic. Upon return to Canada, these materials will be kept in a secure location in British Columbia by the researcher until the allotted time has passed. After the five years, the audio recordings and transcripts will be destroyed.

If you would like a copy of the final Masters thesis resulting from this research please email me your request.

The above conditions conform to the research ethics guidelines of the University of Northern British Columbia and I – M. Sherstobitoff, am obligated to carry them out.

The conditions of this consent are known to the academic supervisors of this Masters thesis research. The research committee is composed of: academic supervisor Dr. Chris Opio, Department of Ecosystem Science and Management, UNBC; committee member Dr. Debra Straussfogel, Geography Department, UNBC; and committee member Dr Marla Emery, Research Geographer at the Aiken Laboratory of Forest Science, Vermont, U.S.A.

Ms. Olga Bahireva from the Office of International Programmes at Syktyvkar State University can also be contacted in Syktyvkar, Komi Republic if you have any questions or comments about the research referred to in this consent form.

Contact information is as follows:

- Ms Nina Alexandrovna Nesterova, Head of the Centre for Socio-cultural service and tourism, 167001, Syktyvkar, 55, office #402. Telephone: +7(8212)24-56-82 (in Komi or Russian).
- Dr. Opio, (in English) by telephone, +1 (250) 960-5868 or email, opio@unbc.ca
- Dr. Straussfogel, (in English) by telephone, +1 (250) 960-6121 or email, straussd@unbc.ca (in English)
- Dr. Emery, (in English) by telephone, +1 (802) 951-6771 ext. 1060 or email, memery@fs.fed.us (in English)
- Melanie Sherstobitoff (Sherstobitova Marusia Iosifovna), (in Russian or English), email, sherstom@unbc.ca or by telephone through the international centre at the Syktyvkar State University.

Any complaints that you may have concerning this study should be directed to: the Vice-President Research, at the Office of Research, University of Northern British Columbia, by telephone 1+ (250) 960-5820 (in English).

Consent:

I understand the information presented in this form and agree to participate in this study under the conditions outlined above.

Name of Participant: _____

Signature of Participant: _____

Name of Researcher: Melanie Sherstobitoff (Sherstobitova Marusia Iosifovna)

Location: _____

Date: _____

Questionnaire

Instructions: Please have the adult household member with the most recent birth date read the attached consent form carefully, sign it if agreeing to participate, then fill out this questionnaire.

Survey Number:		Village and Region:	
Gender:		Age:	Profession:

1. List the members of your household and their ages (for example: grandmother – 67, son – 5, etc.)

Household Member	**Age**	**Household Member**	**Age**

2. Non-timber forest products are defined by this study as: fuelwood, non-wood materials derived from trees, shrubs, forbs, non-vascular plant, fungi and micro-organisms that live in forest or grassland ecosystems. Do you collect non-timber forest products?

   Yes ☐ No ☐

3. What specific non-timber forest products do you collect during each month of the year?

Month:	Non-timber forest product collected:
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	

4. What is your ethnicity?

Russian ☐	Komi ☐	Other ☐ Specify:	

5. What do you do with the non-timber forest products you collect? Rank in order of importance with: 1 = most important, 2 = less important, etc.

Personal/Household use.....☐ Give as Gifts.....☐

Sell.....☐ Other ☐ Specify: _____

Trade/Barter.....☐

6. Which way of using the non-timber forest products you collect is the most important to you? Rank in order of importance with: 1 = most important, 2 = less important, etc.

For Food.....☐ For Clothing.....☐

For Fuel.....☐ For Crafting Material.....☐

For Medicine.....☐ For Religious/Ceremonial Purposes.....☐

For Fodder.....☐ Other ☐ Specify: _____

7. Are you currently employed in your profession?

Yes ☐	No ☐ Why not?	

8. What is your total household income?

Less than 1000 rubles/month.....☐	6000-10000 rubles/month.....☐	
1000-3000 rubles/month.....☐	More than 10000 rubles/month.....☐	
3000-6000 rubles/month.....☐	Exact household income (optional):	

9. Name the places where you collect non-timber forest products.

_____

_____

10. How far away from your house do you have to travel in order to collect non-timber forest products? Rank in order of frequency with: 1 = frequent, 2 = less frequent, etc.

<1 km.....☐	1 - 2 km.....☐	2-3 km.....☐	
3-4 km.....☐	4-5 km.....☐	5-10 km.....☐	
10-15 km.....☐	15+ km.....☐	Other ☐ Specify:	

11. Why do you collect non-timber forest products? List your reasons in order of importance. 1 = most important, 2 = less important, etc.

12. Which non-timber forest product is most important to you? Why?

_____

_____

Соглашение о содействии в исследованиях М. Шерстобитофф по теме "Социально-экономические факторы влияющие на сбор не-древесных лесных ресурсов в Республике Коми".

Добровольное соглашение заключается между М. Шерстобитофф, студентка Университета Северной Британской Колумбии (Канада), с одной стороны и
_____, с другой стороны.

Описание Соглашения:

Намерение исследования по теме "Социально-экономические факторы влияющие на сбор не-древесных лесных ресурсов в Республике Коми" – изучение особенностей сбора и использования не-древеасных лесных ресурсов (например: ягоды, грибы, береста, и.т.д.) в Республике Коми. Также, планируется выявить кто собирает не-древесные лесные ресурсы в Республике Коми и для чего они их собирают. Это исследование проводится в качестве дипломной работы на соискание степени магистра по лесному хозяйству в Университете Северной Британской Колумбии (Канада).

Уважаемые,_____,
Обращение к Вам основано на случайный выборке Вашего дома из место,
_____.

Условия Соглашения:

Добровольное соглашение может быть достигнуто в письменной или устной форме. Она касается представления Вами каких-либо сведений по теме исследования. Вы можете прекратить его в любое время, а также в любое время изъять информацию, данную Вами. Вся информация, переданная Вами в устной или письменной форме, конфиденциальна и будет использована только в учебно-исследовательских целях.

Ваше добровольное участие в настоящем исследовании может быть упомянуто в дипломной работе или, наоборот, по Вашему желанию, не будет отмечено.

Материалы, предоставленные Вами или записанные на диктофон, будут использованы только мной (исследователем М. Шерстобитофф) и моими непосредственными академическими руководителями:

- в научных отчетах и итоговой дипломной работе по исследовательскому проекту по данной теме;
- в публикациях в научных и популярных изданиях с целью представления результатов настоящего исследования;
- в докладах, в выступлениях, в выставках, в интернет-сообщениях, посвященных результатам исследования.

Другие ученые и исследователи, которые интересуются темой сбора не-древесных лесных ресурсов в Республике Коми не будут использовать представленные Вами материалы или диктофонные записи. Диктофонные кассеты и исследовательские записи будут храниться в течение пяти лет после завершения настоящего дипломного исследования. Рабочие материалы будут храниться конфиденциально в Сыткывкарском госуниверситете пока исследования будут проходить в Республике Коми, затем – лично у исследователя в Британской Колумбии, в Канаде, до уничтожения по истечению оговоренного срока.

Если вы желаете копию итоговой дипломной работы на английском языке отправте мне просьбу по обычной почте или по электронной почте.

Приведенные выше условия соответствуют этическим нормам, принятым в Университете Северной Британской Колумбии и я – М. Шерстобитофф, обязуюсь их выполнять.

Условия данного соглашения известны академическим руководителям настоящего дипломного исследования – доктор Крис Опио (кафедра природных ресурсов) Университет Северной Британской Колумбии, доктор Дебра Страусфогел (кафедра географии) Университет Северной Британской Колумбии, и доктор Марла Емери, геогроф в Аикен Лаборитория Лесной Науки, Вермонт, С.Ш.А.

Можно связаться:

- с Ниной Александровной Нестеровой, Руководитель Центра социально-культурного сервиса и туризма, 167001, г. Сыктывкар пр-т, 55, каб. 402. Телефон: +7(8212)24-56-82 (на коми или русском языке).

- с доктором Опио по телефону +1 (250) 960-5868 или электронной почте opio@unbc.ca (на английском языке);

- с доктором Страусфогел по телефону +1 (250) 960-6121 или электронной почте straussd@unbc.ca (на английском языке);

- с доктором Емери по телефону +1 (802) 951-6771 1060 или электронной почте memery@fs.fed.us (на английском языке).

- со мной, Мелани Шерстобитофф (Шерстобитова Маруся Иосифовна), можно связаться на русском или английском языках по электронной почте sherstom@unbc.ca а также по телефону в Эжве: 62-72-05.

Жалоба касающейся этого исследования сообщайте: вице-президенту, в Конторе Исследования, Университета Северной Британской Колумбии, по телефону +1 (250) 960-5820 (на английском языке).

Соглашение:

Я понял(а) информацию, которая написана выше, и соглашаюсь участвовать в исследовательской работе на предложенных условиях.

Имя участника: _____

Подпись участника: _____

Имя исследователя: Мелани Шерстобитофф (Шерстобитова Маруся Иосифовна)

Место: _____

Дата: _____

Анкета для исследования по сбору не-древесных лесных ресурсов. Шерстобитова Маруся Иосифовна, аспирантка Университета Северной Британской Колумбии, в Канаде.

Необходимо чтобы заполнил анкету взрослый человек в Вашем доме, кто последний праздновал день рождение. До выполнения анкеты прочитайте «Соглашение о содействии в исследованиях…». Когда заполните, заклейте анкету в конверт чтобы сохранить Вашу анонимность.

Ваш пол: Ж ☐ **М** ☐ Место:_____ Возраст:_____ Номер анкеты:_____
Образование:_____ Кем работаете:_____

1. Кто живёт в Вашем доме, и каков их возраст? (Например: бабушка – 67 лет, сын – 5 лет)

Кто	Возраст	Кто	Возраст

2. Не-древесные лесные ресурсы это всё что растёт в лесу кроме древесины. В том числе: грибы, ягоды, лекарственные растение, береста, дрова для отопления, и.т.д. Вы собираете не-древесные лесные ресурсы?

   Да ☐ Нет ☐ Почему нет?_____

3. Вы каждый год собираете? Да ☐ Нет ☐ Как часто если ни каждый год?_____

4. Что Вы (лично) собираете и в каком месяце?

Месяц	Что я собираю в лесу
Январь	
Февраль	
Март	
Апрель	
Май	
Июнь	
Июль	
Август	
Сентябрь	
Октябрь	
Ноябрь	
Декабрь	

5. Какая у Вас национальность?

   Коми ☐ Русская ☐ Другая ☐ Какая?_____

6. Что Вы делаете с тем, что собираете в лесу? Отмечайте следующие категории 1 = чаще всего, 2 = часто, 3= иногда, 4 = редко, 5 = никогда

Пользуемся дома .....☐	Продаём людям.....☐	Дарим.....☐
Продаём на переработку.....☐	Меняем на другой товар.....☐	Другое использование?_____

7. Как вы пользуетесь тем, что вы собираете в лесу? Отмечайте следующие категории 1 = чаще всего, 2 = очень часто, 3 = часто, 4 = иногда, 5 = редко, 6 = очень редко, 7 = никогда

Для питания.....☐	Корм животным.....☐	Для религиозных/народных обрядов.....☐
Для отопления.....☐	Изготовление одежды/обуви.....☐	Другое использование?_____
На лекарство.....☐	Для творчества.....☐	_____

8. В общем, сколько рублей Вы зарабатываете в месяц?

Не хожу на работу – веду домашнее хозяйство.....☐	6000-10 000 рублей/месяц.....☐
Менее 1000 рублей/месяц.....☐	Более 10 000 рублей/месяц.....☐
1000-3000 рублей/месяц.....☐	Точная сумма заработки:_____
3000-6000 рублей/месяц.....☐	

9. Сколько рублей в общей сумме доход Вашей семьи (в месяц)?_____

10. Как далеко от дома Вы ходите/ездите собирать лесные дары? Отмечайте следующие категории 1 = чаще всего, 2 = очень часто, 3 = часто, 4 = иногда, 5 = редко, 6 = очень редко, 7 = никогда

0-1 км.....☐	1-5 км.....☐	5-10 км.....☐	10-15 км.....☐
15-20 км.....☐	20-30 км.....☐	30+.....☐	Другое расстояние?_____

11. Почему Вы собираете не-древесные лесные ресурсы? Отмечайте, начиная с самой важной причины.

12. Какие не-древесные лесные ресурсы самые важные для Вас? Почему?

Appendix 4
Contingency tables

Village* Collect/Do Not Collect Crosstabulation – Firewood

NTFP	Village	Count	Collect	Do Not Collect	Total
village	Nebdeno	Observed	4	16	20
		Expected	7.7	12.3	20.0
		%	20.0	80.0	100.0
	Griva	Observed	4	13	17
		Expected	6.6	10.4	17.0
		%	23.5	76.5	100.0
	Shoshka	Observed	19	17	36
		Expected	13.9	22.1	36.0
		%	52.8	47.2	100.0
	Pomosdino	Observed	9	14	23
		Expected	8.9	14.1	23.0
		%	39.1	60.9	100.0
	Kuratovo	Observed	20	29	49
		Expected	18.9	30.1	49.0
		%	40.8	59.2	100.0

Village* Collect/Do Not Collect Crosstabulation – Berries

NTFP	Village	Count	Collect	Do Not Collect	Total
Berries	Nebdeno	Observed	18	2	20
		Expected	17.5	2.5	20.0
		%	90.0	10.0	100.0
	Griva	Observed	14	3	17
		Expected	14.9	2.1	17.0
		%	82.4	17.6	100.0
	Shoshka	Observed	34	2	36
		Expected	31.5	4.5	36.0
		%	94.4	5.6	100.0
	Pomosdino	Observed	19	4	23
		Expected	20.1	2.9	23.0
		%	82.6	17.4	100.0
	Kuratovo	Observed	42	7	49
		Expected	42.9	6.1	49.0
		%	85.7	14.3	100.0

Village* Collect/Do Not Collect Crosstabulation – Mushrooms

NTFP	Village	Count	Collect	Do Not Collect	Total
Mushrooms	Nebdeno	Observed	15	5	20
		Expected	16.6	3.4	20.0
		%	75.0	25.0	100.0
	Griva	Observed	13	4	17
		Expected	14.1	2.9	17.0
		%	76.5	23.5	100.0
	Shoshka	Observed	32	4	36
		Expected	29.8	6.2	36.0
		%	88.9	11.1	100.0
	Pomosdino	Observed	18	5	23
		Expected	19.0	4.0	23.0
		%	78.3	21.7	100.0
	Kuratovo	Observed	42	7	49
		Expected	40.6	8.4	49.0
		%	85.7	14.3	100.0

Village* Collect/Do Not Collect Crosstabulation – Medicinal Plants

NTFP	Village	Count	Collect	Do Not Collect	Total
Medicinal Plants	Nebdeno	Observed	7	13	20
		Expected	6.5	13.5	20.0
		%	35.0	65.0	100.0
	Griva	Observed	5	12	17
		Expected	5.5	11.5	17.0
		%	29.4	70.6	100.0
	Shoshka	Observed	12	24	36
		Expected	11.7	24.3	36.0
		%	33.3	66.7	100.0
	Pomosdino	Observed	7	16	23
		Expected	7.5	15.5	23.0
		%	30.4	69.6	100.0
	Kuratovo	Observed	16	33	49
		Expected	15.9	33.1	49.0
		%	32.7	67.3	100.0

Village* Collect/Do Not Collect Crosstabulation – Birch Bark

NTFP	Village	Count	Collect	Do Not Collect	Total
Birch Bark	Nebdeno	Observed	1	19	20
		Expected	5.0	15.0	20.0
		%	5.0	95.0	100.0
	Griva	Observed	3	14	17
		Expected	4.2	12.8	17.0
		%	17.6	82.4	100.0
	Shoshka	Observed	15	21	36
		Expected	8.9	27.1	36.0
		%	41.7	58.3	100.0
	Pomosdino	Observed	3	20	23
		Expected	5.7	17.3	23.0
		%	13.0	87.0	100.0
	Kuratovo	Observed	14	35	49
		Expected	12.2	36.8	49.0
		%	28.6	71.4	100.0

Village* Collect/Do Not Collect Crosstabulation – Birch sap

NTFP	Village	Count	Collect	Do Not Collect	Total
Birch Sap	Nebdeno	Observed	3	17	20
		Expected	2.5	17.5	20.0
		%	15.0	85.0	100.0
	Griva	Observed	2	15	17
		Expected	2.1	14.9	17.0
		%	11.8	88.2	100.0
	Shoshka	Observed	4	32	36
		Expected	4.5	31.5	36.0
		%	11.1	88.9	100.0
	Pomosdino	Observed	3	20	23
		Expected	2.9	20.1	23.0
		%	13.0	87.0	100.0
	Kuratovo	Observed	6	43	49
		Expected	6.1	42.9	49.0
		%	12.2	87.8	100.0

Village* Collect/Do Not Collect Crosstabulation – Birch Boughs

NTFP	Village	Count	Collect	Do Not Collect	Total
Birch Boughs	Nebdeno	Observed	4	16	20
		Expected	5.4	14.6	20.0
		%	20.0	80.0	100.0
	Griva	Observed	4	13	17
		Expected	4.6	12.4	17.0
		%	23.5	76.5	100.0
	Shoshka	Observed	11	25	36
		Expected	9.7	26.3	36.0
		%	30.6	69.4	100.0
	Pomosdino	Observed	7	16	23
		Expected	6.2	16.8	23.0
		%	30.4	69.6	100.0
	Kuratovo	Observed	13	36	49
		Expected	13.2	35.8	49.0
		%	26.5	73.5	100.0

Village* Collect/Do Not Collect Crosstabulation – Chaga

NTFP	Village	Count	Collect	Do Not Collect	Total
Chaga	Nebdeno	Observed	1	19	20
		Expected	0.8	19.2	20.0
		%	5.0	95.0	100.0
	Griva	Observed	0	17	17
		Expected	0.7	16.3	17.0
		%	0	100.0	100.0
	Shoshka	Observed	0	36	36
		Expected	1.5	34.5	36.0
		%	0	100.0	100.0
	Pomosdino	Observed	1	22	23
		Expected	1.0	22.0	23.0
		%	4.3	95.7	100.0
	Kuratovo	Observed	4	45	49
		Expected	2.0	47.0	49.0
		%	8.2	91.8	100.0

Gender*Collect/Do Not Collect Crosstabulation

NTFP	Gender	Count	Collect	Do Not Collect	Total
Firewood	female	Observed	33	56	89
		Expected	34.4	54.6	89.0
		%	37.1	62.9	100.0
Firewood	male	Observed	23	33	56
		Expected	21.6	34.4	56.0
		%	41.1	58.9	100.0
Berries	female	Observed	79	10	89
		Expected	78.0	11.0	89.0
		%	88.8	11.2	100.0
Berries	male	Observed	48	8	56
		Expected	49.0	7.0	56.0
		%	85.7	14.3	100.0
Mushrooms	female	Observed	72	17	89
		Expected	73.7	15.3	89.0
		%	80.9	19.1	100.0
Mushrooms	male	Observed	48	8	56
		Expected	46.3	9.7	56.0
		%	85.7	14.3	100.0
Medicinal plants	female	Observed	31	58	89
		Expected	28.8	60.2	89.0
		%	34.8	65.2	100.0
Medicinal plants	male	Observed	16	40	56
		Expected	18.2	37.8	56.0
		%	28.6	71.4	100.0

Gender*Collect/Do Not Collect Crosstabulation (continued)

NTFP	Gender	Count	Collect	Do Not Collect	Total
Birch Bark	female	Observed	19	70	89
		Expected	22.1	66.9	89.0
		%	21.3	78.7	100.0
Birch Bark	male	Observed	17	39	56
		Expected	13.9	42.1	56.0
		%	30.4	69.6	100.0
Birch Sap	female	Observed	8	81	89
		Expected	11.0	78.0	89.0
		%	9.0	91.0	100.0
Birch Sap	male	Observed	10	46	56
		Expected	7.0	49.0	56.0
		%	17.9	82.1	100.0
Birch Boughs	female	Observed	23	66	89
		Expected	23.9	65.1	89.0
		%	25.8	74.2	100.0
Birch Boughs	male	Observed	16	40	56
		Expected	15.1	40.9	56.0
		%	28.6	71.4	100.0
Chaga	female	Observed	2	87	89
		Expected	3.7	85.3	89.0
		%	2.2	97.8	100.0
Chaga	male	Observed	4	52	56
		Expected	2.3	53.7	56.0
		%	7.1	92.9	100.0

Age*Collect/Do Not Collect Crosstabulation - Firewood

NTFP	Age (Yrs.) Category	Count	Collect	Do Not Collect	Total
Firewood	≤19	Observed	0	1	1
		Expected	0.4	0.6	1.0
		%	0	100.0	100.0
	20-24	Observed	1	2	3
		Expected	1.1	1.9	3.0
		%	33.3	66.7	100.0
	25-34	Observed	9	9	18
		Expected	6.8	11.2	18.0
		%	50.0	50.0	100.0
	35-44	Observed	15	26	41
		Expected	15.5	25.5	41.0
		%	36.6	63.4	100.0
	45-54	Observed	14	24	38
		Expected	14.3	23.7	38.0
		%	36.8	63.2	100.0
	55-64	Observed	1	8	9
		Expected	3.4	5.6	9.0
		%	11.1	88.9	100.0
	65+	Observed	14	19	33
		Expected	12.5	20.5	33.0
		%	42.4	57.6	100.0

Age*Collect/Do Not Collect Crosstabulation – Berries

NTFP	Age (Yrs.) Category	Count	Collect	Do Not Collect	Total
Berries	≤19	Observed	1	0	1
		Expected	0.9	0.1	1.0
		%	100.0	0	100.0
	20-24	Observed	3	0	3
		Expected	2.6	0.4	3.0
		%	100.0	0	100.0
	25-34	Observed	17	1	18
		Expected	15.7	2.3	18.0
		%	94.4	5.6	100.0
	35-44	Observed	35	6	41
		Expected	35.8	5.2	41.0
		%	85.4	14.6	100.0
	45-54	Observed	31	7	38
		Expected	33.2	4.8	38.0
		%	81.6	18.4	100.0
	55-64	Observed	7	2	9
		Expected	7.9	1.1	9.0
		%	77.8	22.2	100.0
	65+	Observed	31	2	33
		Expected	28.8	4.2	33.0
		%	93.9	6.1	100.0

Age*Collect/Do Not Collect Crosstabulation – Mushrooms

NTFP	Age (Yrs.) Category	Count	Collect	Do Not Collect	Total
Mushrooms	≤19	Observed	0	1	1
		Expected	0.8	.2	1.0
		%	0	100.0	100.0
	20-24	Observed	3	0	3
		Expected	2.5	0.5	3.0
		%	100.0	0	100.0
	25-34	Observed	17	1	18
		Expected	14.9	3.1	18.0
		%	94.4	5.6	100.0
	35-44	Observed	34	7	41
		Expected	33.8	7.2	41.0
		%	82.9	17.1	100.0
	45-54	Observed	29	9	38
		Expected	31.4	6.6	38.0
		%	76.3	23.7	100.0
	55-64	Observed	6	3	9
		Expected	7.4	1.6	9.0
		%	66.7	33.3	100.0
	65+	Observed	29	4	33
		Expected	27.2	5.8	33.0
		%	87.9	12.1	100.0

Age*Collect/Do Not Collect Crosstabulation – Medicinal Plants

NTFP	Age (Yrs.) Category	Count	Collect	Do Not Collect	Total
Medicinal plants	≤19	Observed	0	1	1
		Expected	0.3	0.7	1.0
		%	0	100.0	100.0
	20-24	Observed	1	2	3
		Expected	1.0	2.0	3.0
		%	33.3	66.7	100.0
	25-34	Observed	9	9	18
		Expected	5.8	12.2	18.0
		%	50.0	50.0	100.0
	35-44	Observed	15	26	41
		Expected	13.2	27.8	41.0
		%	36.6	63.4	100.0
	45-54	Observed	9	29	38
		Expected	12.2	25.8	38.0
		%	23.7	76.3	100.0
	55-64	Observed	1	8	9
		Expected	2.9	6.1	9.0
		%	11.1	88.9	100.0
	65+	Observed	11	22	33
		Expected	10.6	22.4	33.0
		%	33.3	66.7	100.0

Age*Collect/Do Not Collect Crosstabulation – Birch Bark

NTFP	Age (Yrs.) Category	Count	Collect	Do Not Collect	Total
Birch Bark	≤19	Observed	0	1	1
		Expected	0.3	0.7	1.0
		%	0	100.0	100.0
	20-24	Observed	2	1	3
		Expected	0.8	2.2	3.0
		%	66.7	33.3	100.0
	25-34	Observed	5	13	18
		Expected	4.5	13.5	18.0
		%	27.8	72.2	100.0
	35-44	Observed	10	31	41
		Expected	10.3	30.7	41.0
		%	24.4	75.6	100.0
	45-54	Observed	10	28	38
		Expected	9.6	28.4	38.0
		%	26.3	73.7	100.0
	55-64	Observed	1	8	9
		Expected	2.3	6.7	9.0
		%	11.1	88.9	100.0
	65+	Observed	8	25	33
		Expected	8.3	24.7	33.0
		%	24.2	75.8	100.0

Age*Collect/Do Not Collect Crosstabulation – Birch Sap

NTFP	Age (Yrs.) Category	Count	Collect	Do Not Collect	Total
Birch Sap	≤19	Observed	0	1	1
		Expected	0.1	0.9	1.0
		%	0	100.0	100.0
	20-24	Observed	1	2	3
		Expected	0.4	2.6	3.0
		%	33.3	66.7	100.0
	25-34	Observed	3	15	18
		Expected	2.3	15.7	18.0
		%	16.7	83.3	100.0
	35-44	Observed	7	34	41
		Expected	5.2	35.8	41.0
		%	17.1	82.9	100.0
	45-54	Observed	3	35	38
		Expected	4.8	33.2	38.0
		%	7.9	92.1	100.0
	55-64	Observed	2	7	9
		Expected	1.1	7.9	9.0
		%	22.2	77.8	100.0
	65+	Observed	2	31	33
		Expected	4.2	28.8	33.0
		%	6.1	93.9	100.0

Age*Collect/Do Not Collect Crosstabulation – Birch Boughs

NTFP	Age (Yrs.) Category	Count	Collect	Do Not Collect	Total
Birch Boughs	≤19	Observed	0	1	1
		Expected	0.3	0.7	1.0
		%	0	100.0	100.0
	20-24	Observed	0	3	3
		Expected	0.8	2.2	3.0
		%	0	100.0	100.0
	25-34	Observed	6	12	18
		Expected	4.9	13.1	18.0
		%	33.3	66.7	100.0
	35-44	Observed	13	28	41
		Expected	11.2	29.8	41.0
		%	31.7	68.3	100.0
	45-54	Observed	8	30	38
		Expected	10.4	27.6	38.0
		%	21.1	78.9	100.0
	55-64	Observed	3	6	9
		Expected	2.5	6.5	9.0
		%	33.3	66.7	100.0
	65+	Observed	9	24	33
		Expected	9.0	24.0	33.0
		%	27.3	72.7	100.0

Age*Collect/Do Not Collect Crosstabulation – Chaga

NTFP	Age (Yrs.) Category	Count	Collect	Do Not Collect	Total
Chaga	≤19	Observed	0	1	1
		Expected	0	1.0	1.0
		%	0	100.0	100.0
	20-24	Observed	0	3	3
		Expected	0.1	2.9	3.0
		%	0	100.0	100.0
	25-34	Observed	1	17	18
		Expected	0.8	17.2	18.0
		%	5.6	94.4	100.0
	35-44	Observed	3	38	41
		Expected	1.7	39.3	41.0
		%	7.3	92.7	100.0
	45-54	Observed	0	38	38
		Expected	1.6	36.4	38.0
		%	0	100.0	100.0
	55-64	Observed	0	9	9
		Expected	0.4	8.6	9.0
		%	0	100.0	100.0
	65+	Observed	2	31	33
		Expected	1.4	31.6	33.0
		%	6.1	93.9	100.0

Education*Collect/Do Not Collect Crosstabulation – Firewood

NTFP	Education Level	Count	Collect	Do Not Collect	Total
Firewood	Elementary	Observed	16	13	29
		Expected	11.7	17.3	29.0
		%	55.2	44.8	100.0
	Secondary	Observed	16	17	33
		Expected	13.4	19.6	33.0
		%	48.5	51.5	100.0
	Technical	Observed	20	34	54
		Expected	21.8	32.2	54.0
		%	37.0	63.0	100.0
	University	Observed	1	14	15
		Expected	6.1	8.9	15.0
		%	6.7	93.3	100.0

Education*Collect/Do Not Collect Crosstabulation – Berries

NTFP	Education Level	Count	Collect	Do Not Collect	Total
Berries	Elementary	Observed	29	0	29
		Expected	26.1	2.9	29.0
		%	100.0	0	100.0
	Secondary	Observed	29	4	33
		Expected	29.7	3.3	33.0
		%	87.9	12.1	100.0
	Technical	Observed	50	4	54
		Expected	48.6	5.4	54.0
		%	92.6	7.4	100.0
	University	Observed	10	5	15
		Expected	13.5	1.5	15.0
		%	66.7	33.3	100.0

Education*Collect/Do Not Collect Crosstabulation – Mushrooms

NTFP	Education Level	Count	Collect	Do Not Collect	Total
Mushrooms	Elementary	Observed	27	2	29
		Expected	24.6	4.4	29.0
		%	93.1	6.9	100.0
	Secondary	Observed	28	5	33
		Expected	28.0	5.0	33.0
		%	84.8	15.2	100.0
	Technical	Observed	45	9	54
		Expected	45.8	8.2	54.0
		%	83.3	16.7	100.0
	University	Observed	11	4	15
		Expected	12.7	2.3	15.0
		%	73.3	26.7	100.0

Education*Collect/Do Not Collect Crosstabulation – Medicinal Plants

NTFP	Education Level	Count	Collect	Do Not Collect	Total
Medicinal Plants	Elementary	Observed	11	18	29
		Expected	9.7	19.3	29.0
		%	37.9	62.1	100.0
	Secondary	Observed	14	19	33
		Expected	11.1	21.9	33.0
		%	42.4	57.6	100.0
	Technical	Observed	15	39	54
		Expected	18.1	35.9	54.0
		%	27.8	72.2	100.0
	University	Observed	4	11	15
		Expected	5.0	10.0	15.0
		%	26.7	73.3	100.0

Education*Collect/Do Not Collect Crosstabulation – Birch Bark

NTFP	Education Level	Count	Collect	Do Not Collect	Total
Birch Bark	Elementary	Observed	13	16	29
		Expected	8.0	21.0	29.0
		%	44.8	55.2	100.0
	Secondary	Observed	12	21	33
		Expected	9.1	23.9	33.0
		%	36.4	63.6	100.0
	Technical	Observed	9	45	54
		Expected	14.8	39.2	54.0
		%	16.7	83.3	100.0
	University	Observed	2	13	15
		Expected	4.1	10.9	15.0
		%	13.3	86.7	100.0

Education*Collect/Do Not Collect Crosstabulation – Birch Sap

NTFP	Education Level	Count	Collect	Do Not Collect	Total
Birch Sap	Elementary	Observed	6	23	29
		Expected	4.0	25.0	29.0
		%	20.7	79.3	100.0
	Secondary	Observed	9	24	33
		Expected	4.5	28.5	33.0
		%	27.3	72.7	100.0
	Technical	Observed	3	51	54
		Expected	7.4	46.6	54.0
		%	5.6	94.4	100.0
	University	Observed	0	15	15
		Expected	2.1	12.9	15.0
		%	0	100.0	100.0

Education*Collect/Do Not Collect Crosstabulation – Birch Boughs

NTFP	Education Level	Count	Collect	Do Not Collect	Total
Birch Boughs	Elementary	Observed	10	19	29
		Expected	8.6	20.4	29.0
		%	34.5	65.5	100.0
	Secondary	Observed	9	24	33
		Expected	9.8	23.2	33.0
		%	27.3	72.7	100.0
	Technical	Observed	16	38	54
		Expected	16.1	37.9	54.0
		%	29.6	70.4	100.0
	University	Observed	4	11	15
		Expected	4.5	10.5	15.0
		%	26.7	73.3	100.0

Education*Collect/Do Not Collect Crosstabulation – Chaga

NTFP	Education Level	Count	Collect	Do Not Collect	Total
Chaga	Elementary	Observed	1	28	29
		Expected	1.3	27.7	29.0
		%	3.4	96.6	100.0
	Secondary	Observed	1	32	33
		Expected	1.5	31.5	33.0
		%	3.0	97.0	100.0
	Technical	Observed	3	51	54
		Expected	2.5	51.5	54.0
		%	5.6	94.4	100.0
	University	Observed	1	14	15
		Expected	0.7	14.3	15.0
		%	6.7	93.3	100.0

Occupation*Collect/Do Not Collect Crosstabulation – Firewood

NTFP	Occupation Category	Count	Collect	Do Not Collect	Total
Firewood	Unemployed	Observed	10	13	23
		Expected	9.3	13.7	23.0
		%	43.5	56.5	100.0
	Pensioner	Observed	20	32	52
		Expected	21.0	31.0	52.0
		%	38.5	61.5	100.0
	Labourer	Observed	12	11	23
		Expected	9.3	13.7	23.0
		%	52.2	47.8	100.0
	Technical	Observed	3	8	11
		Expected	4.4	6.6	11.0
		%	27.3	72.7	100.0
	Professional	Observed	10	17	27
		Expected	10.9	16.1	27.0
		%	37.0	63.0	100.0

Occupation*Collect/Do Not Collect Crosstabulation – Berries

NTFP	Occupation Category	Count	Collect	Do Not Collect	Total
Berries	Unemployed	Observed	20	3	23
		Expected	20.5	2.5	23.0
		%	87.0	13.0	100.0
	Pensioner	Observed	49	3	52
		Expected	46.3	5.7	52.0
		%	94.2	5.8	100.0
	Labourer	Observed	22	1	23
		Expected	20.5	2.5	23.0
		%	95.7	4.3	100.0
	Technical	Observed	9	2	11
		Expected	9.8	1.2	11.0
		%	81.8	18.2	100.0
	Professional	Observed	21	6	27
		Expected	24.0	3.0	27.0
		%	77.8	22.2	100.0

Occupation*Collect/Do Not Collect Crosstabulation – Mushrooms

NTFP	Occupation Category	Count	Collect	Do Not Collect	Total
Mushrooms	Unemployed	Observed	20	3	23
		Expected	19.3	3.7	23.0
		%	87.0	13.0	100.0
	Pensioner	Observed	45	7	52
		Expected	43.6	8.4	52.0
		%	86.5	13.5	100.0
	Labourer	Observed	20	3	23
		Expected	19.3	3.7	23.0
		%	87.0	13.0	100.0
	Technical	Observed	7	4	11
		Expected	9.2	1.8	11.0
		%	63.6	36.4	100.0
	Professional	Observed	22	5	27
		Expected	22.6	4.4	27.0
		%	81.5	18.5	100.0

Occupation*Collect/Do Not Collect Crosstabulation – Medicinal Plants

NTFP	Occupation Category	Count	Collect	Do Not Collect	Total
Medicinal Plants	Unemployed	Observed	10	13	23
		Expected	7.6	15.4	23.0
		%	43.5	56.5	100.0
	Pensioner	Observed	16	36	52
		Expected	17.2	34.8	52.0
		%	30.8	69.2	100.0
	Labourer	Observed	8	15	23
		Expected	7.6	15.4	23.0
		%	34.8	65.2	100.0
	Technical	Observed	4	7	11
		Expected	3.6	7.4	11.0
		%	36.4	63.6	100.0
	Professional	Observed	7	20	27
		Expected	8.9	18.1	27.0
		%	25.9	74.1	100.0

Occupation*Collect/Do Not Collect Crosstabulation – Birch Bark

NTFP	Occupation Category	Count	Collect	Do Not Collect	Total
Birch Bark	Unemployed	Observed	11	12	23
		Expected	6.1	16.9	23.0
		%	47.8	52.2	100.0
	Pensioner	Observed	12	40	52
		Expected	13.8	38.2	52.0
		%	23.1	76.9	100.0
	Labourer	Observed	6	17	23
		Expected	6.1	16.9	23.0
		%	26.1	73.9	100.0
	Technical	Observed	1	10	11
		Expected	2.9	8.1	11.0
		%	9.1	90.9	100.0
	Professional	Observed	6	21	27
		Expected	7.1	19.9	27.0
		%	22.2	77.8	100.0

Occupation*Collect/Do Not Collect Crosstabulation – Birch Sap

NTFP	Occupation Category	Count	Collect	Do Not Collect	Total
Birch Sap	Unemployed	Observed	7	16	23
		Expected	3.0	20.0	23.0
		%	30.4	69.6	100.0
	Pensioner	Observed	6	46	52
		Expected	6.9	45.1	52.0
		%	11.5	88.5	100.0
	Labourer	Observed	3	20	23
		Expected	3.0	20.0	23.0
		%	13.0	87.0	100.0
	Technical	Observed	1	10	11
		Expected	1.5	9.5	11.0
		%	9.1	90.9	100.0
	Professional	Observed	1	26	27
		Expected	3.6	23.4	27.0
		%	3.7	96.3	100.0

Occupation*Collect/Do Not Collect Crosstabulation – Birch Boughs

NTFP	Occupation Category	Count	Collect	Do Not Collect	Total
Birch Boughs	Unemployed	Observed	9	14	23
		Expected	6.6	16.4	23.0
		%	39.1	60.9	100.0
	Pensioner	Observed	15	37	52
		Expected	14.9	37.1	52.0
		%	28.8	71.2	100.0
	Labourer	Observed	8	15	23
		Expected	6.6	16.4	23.0
		%	34.8	65.2	100.0
	Technical	Observed	1	10	11
		Expected	3.2	7.8	11.0
		%	9.1	90.9	100.0
	Professional	Observed	6	21	27
		Expected	7.7	19.3	27.0
		%	22.2	77.8	100.0

Occupation*Collect/Do Not Collect Crosstabulation – Chaga

NTFP	Occupation Category	Count	Collect	Do Not Collect	Total
Chaga	Unemployed	Observed	1	22	23
		Expected	1.0	22.0	23.0
		%	4.3	95.7	100.0
	Pensioner	Observed	2	50	52
		Expected	2.3	49.7	52.0
		%	3.8	96.2	100.0
	Labourer	Observed	0	23	23
		Expected	1.0	22.0	23.0
		%	0	100.0	100.0
	Technical	Observed	0	11	11
		Expected	0.5	10.5	11.0
		%	0	100.0	100.0
	Professional	Observed	3	24	27
		Expected	1.2	25.8	27.0
		%	11.1	88.9	100.0

Number of People in Household*Collect/Do Not Collect Crosstabulation – Firewood

NTFP	# of People in Household	Count	Collect	Do Not Collect	Total
Firewood	1	Observed	19	24	43
		Expected	16.6	26.4	43.0
		%	44.2	55.8	100.0
	2	Observed	12	20	32
		Expected	12.4	19.6	32.0
		%	37.5	62.5	100.0
	3	Observed	10	19	29
		Expected	11.2	17.8	29.0
		%	34.5	65.5	100.0
	4	Observed	12	16	28
		Expected	10.8	17.2	28.0
		%	42.9	57.1	100.0
	5	Observed	1	7	8
		Expected	3.1	4.9	8.0
		%	12.5	87.5	100.0
	6	Observed	2	3	5
		Expected	1.9	3.1	5.0
		%	40.0	60.0	100.0

Number of People in Household*Collect/Do Not Collect Crosstabulation – Berries

NTFP	# of People in Household	Count	Collect	Do Not Collect	Total
Berries	1	Observed	39	4	43
		Expected	37.7	5.3	43.0
		%	90.7	9.3	100.0
	2	Observed	28	4	32
		Expected	28.0	4.0	32.0
		%	87.5	12.5	100.0
	3	Observed	26	3	29
		Expected	25.4	3.6	29.0
		%	89.7	10.3	100.0
	4	Observed	23	5	28
		Expected	24.5	3.5	28.0
		%	82.1	17.9	100.0
	5	Observed	7	1	8
		Expected	7.0	1.0	8.0
		%	87.5	12.5	100.0
	6	Observed	4	1	5
		Expected	4.4	0.6	5.0
		%	80.0	20.0	100.0

Number of People in Household*Collect/Do Not Collect Crosstabulation – Mushrooms

NTFP	# of People in Household	Count	Collect	Do Not Collect	Total
Mushrooms	1	Observed	38	5	43
		Expected	35.6	7.4	43.0
		%	88.4	11.6	100.0
	2	Observed	26	6	32
		Expected	26.5	5.5	32.0
		%	81.3	18.8	100.0
	3	Observed	24	5	29
		Expected	24.0	5.0	29.0
		%	82.8	17.2	100.0
	4	Observed	21	7	28
		Expected	23.2	4.8	28.0
		%	75.0	25.0	100.0
	5	Observed	7	1	8
		Expected	6.6	1.4	8.0
		%	87.5	12.5	100.0
	6	Observed	4	1	5
		Expected	4.1	0.9	5.0
		%	80.0	20.0	100.0

Number of People in Household*Collect/Do Not Collect Crosstabulation – Medicinal Plants

NTFP	# of People in Household	Count	Collect	Do Not Collect	Total
Medicinal Plants	1	Observed	17	26	43
		Expected	13.9	29.1	43.0
		%	39.5	60.5	100.0
	2	Observed	9	23	32
		Expected	10.4	21.6	32.0
		%	28.1	71.9	100.0
	3	Observed	9	20	29
		Expected	9.4	19.6	29.0
		%	31.0	69.0	100.0
	4	Observed	9	19	28
		Expected	9.1	18.9	28.0
		%	32.1	67.9	100.0
	5	Observed	2	6	8
		Expected	2.6	5.4	8.0
		%	25.0	75.0	100.0
	6	Observed	1	4	5
		Expected	1.6	3.4	5.0
		%	20.0	80.0	100.0

Number of People in Household*Collect/Do Not Collect Crosstabulation – Birch Bark

NTFP	# of People in Household	Count	Collect	Do Not Collect	Total
Birch Bark	1	Observed	9	34	43
		Expected	10.7	32.3	43.0
		%	6.2	23.4	29.7
	2	Observed	8	24	32
		Expected	7.9	24.1	32.0
		%	25.0	75.0	100.0
	3	Observed	3	26	29
		Expected	7.2	21.8	29.0
		%	10.3	89.7	100.0
	4	Observed	13	15	28
		Expected	7.0	21.0	28.0
		%	46.4	53.6	100.0
	5	Observed	1	7	8
		Expected	2.0	6.0	8.0
		%	12.5	87.5	100.0
	6	Observed	2	3	5
		Expected	1.2	3.8	5.0
		%	40.0	60.0	100.0

Number of People in Household*Collect/Do Not Collect Crosstabulation – Birch Sap

NTFP	# of People in Household	Count	Collect	Do Not Collect	Total
Birch Sap	1	Observed	7	36	43
		Expected	5.3	37.7	43.0
		%	16.3	83.7	100.0
	2	Observed	1	31	32
		Expected	4.0	28.0	32.0
		%	3.1	96.9	100.0
	3	Observed	3	26	29
		Expected	3.6	25.4	29.0
		%	10.3	89.7	100.0
	4	Observed	7	21	28
		Expected	3.5	24.5	28.0
		%	25.0	75.0	100.0
	5	Observed	0	8	8
		Expected	1.0	7.0	8.0
		%	0	100.0	100.0
	6	Observed	0	5	5
		Expected	0.6	4.4	5.0
		%	0	100.0	100.0

Number of People in Household*Collect/Do Not Collect Crosstabulation – Birch Boughs

NTFP	# of People in Household	Count	Collect	Do Not Collect	Total
Birch Boughs	1	Observed	12	31	43
		Expected	11.6	31.4	43.0
		%	27.9	72.1	100.0
	2	Observed	9	23	32
		Expected	8.6	23.4	32.0
		%	28.1	71.9	100.0
	3	Observed	7	22	29
		Expected	7.8	21.2	29.0
		%	24.1	75.9	100.0
	4	Observed	8	20	28
		Expected	7.5	20.5	28.0
		%	28.6	71.4	100.0
	5	Observed	2	6	8
		Expected	2.2	5.8	8.0
		%	25.0	75.0	100.0
	6	Observed	1	4	5
		Expected	1.3	3.7	5.0
		%	20.0	80.0	100.0

Number of People in Household*Collect/Do Not Collect Crosstabulation – Chaga

NTFP	# of People in Household	Count	Collect	Do Not Collect	Total
Chaga	1	Observed	1	42	43
		Expected	1.8	41.2	43.0
		%	2.3	97.7	100.0
	2	Observed	2	30	32
		Expected	1.3	30.7	32.0
		%	6.3	93.8	100.0
	3	Observed	1	28	29
		Expected	1.2	27.8	29.0
		%	3.4	96.6	100.0
	4	Observed	2	26	28
		Expected	1.2	26.8	28.0
		%	7.1	92.9	100.0
	5	Observed	0	8	8
		Expected	0.3	7.7	8.0
		%	0	100.0	100.0
	6	Observed	0	5	5
		Expected	0.2	4.8	5.0
		%	0	100.0	100.0

Income*Collect/Do Not Collect Crosstabulation – Firewood

NTFP	Income Level (Rubles/Mo.)	Count	Collect	Do Not Collect	Total
Firewood	0	Observed	6	14	20
		Expected	7.7	12.3	20.0
		%	30.0	70.0	100.0
	>1000	Observed	5	4	9
		Expected	3.4	5.6	9.0
		%	55.6	44.4	100.0
	1000-3000	Observed	27	44	71
		Expected	27.2	43.8	71.0
		%	38.0	62.0	100.0
	3000-6000	Observed	10	19	29
		Expected	11.1	17.9	29.0
		%	34.5	65.5	100.0
	< 6000	Observed	6	6	12
		Expected	4.6	7.4	12.0
		%	50.0	50.0	100.0

Income*Collect/Do Not Collect Crosstabulation – Berries

NTFP	Income Level (Rubles/Mo.)	Count	Collect	Do Not Collect	Total
Berries	0	Observed	18	2	20
		Expected	17.7	2.3	20.0
		%	90.0	10.0	100.0
	>1000	Observed	8	1	9
		Expected	8.0	1.0	9.0
		%	88.9	11.1	100.0
	1000-3000	Observed	63	8	71
		Expected	62.9	8.1	71.0
		%	88.7	11.3	100.0
	3000-6000	Observed	26	3	29
		Expected	25.7	3.3	29.0
		%	89.7	10.3	100.0
	< 6000	Observed	10	2	12
		Expected	10.6	1.4	12.0
		%	83.3	16.7	100.0

Income*Collect/Do Not Collect Crosstabulation – Mushrooms

NTFP	Income Level (Rubles/Mo.)	Count	Collect	Do Not Collect	Total
Mushrooms	0	Observed	16	4	20
		Expected	16.7	3.3	20.0
		%	80.0	20.0	100.0
	>1000	Observed	8	1	9
		Expected	7.5	1.5	9.0
		%	88.9	11.1	100.0
	1000-3000	Observed	59	12	71
		Expected	59.4	11.6	71.0
		%	83.1	16.9	100.0
	3000-6000	Observed	26	3	29
		Expected	24.3	4.7	29.0
		%	89.7	10.3	100.0
	< 6000	Observed	9	3	12
		Expected	10.0	2.0	12.0
		%	75.0	25.0	100.0

Income*Collect/Do Not Collect Crosstabulation – Medicinal Plants

NTFP	Income Level (Rubles/Mo.)	Count	Collect	Do Not Collect	Total
Medicinal Plants	0	Observed	7	13	20
		Expected	6.5	13.5	20.0
		%	35.0	65.0	100.0
	>1000	Observed	2	7	9
		Expected	2.9	6.1	9.0
		%	22.2	77.8	100.0
	1000-3000	Observed	22	49	71
		Expected	23.2	47.8	71.0
		%	31.0	69.0	100.0
	3000-6000	Observed	11	18	29
		Expected	9.5	19.5	29.0
		%	37.9	62.1	100.0
	< 6000	Observed	4	8	12
		Expected	3.9	8.1	12.0
		%	33.3	66.7	100.0

Income*Collect/Do Not Collect Crosstabulation – Birch Bark

NTFP	Income Level (Rubles/Mo.)	Count	Collect	Do Not Collect	Total
Birch Bark	0	Observed	6	14	20
		Expected	5.0	15.0	20.0
		%	30.0	70.0	100.0
	>1000	Observed	1	8	9
		Expected	2.2	6.8	9.0
		%	11.1	88.9	100.0
	1000-3000	Observed	16	55	71
		Expected	17.6	53.4	71.0
		%	22.5	77.5	100.0
	3000-6000	Observed	9	20	29
		Expected	7.2	21.8	29.0
		%	31.0	69.0	100.0
	< 6000	Observed	3	9	12
		Expected	3.0	9.0	12.0
		%	25.0	75.0	100.0

Income*Collect/Do Not Collect Crosstabulation – Birch Sap

NTFP	Income Level (Rubles/Mo.)	Count	Collect	Do Not Collect	Total
Birch Sap	0	Observed	3	17	20
		Expected	2.4	17.6	20.0
		%	15.0	85.0	100.0
	>1000	Observed	0	9	9
		Expected	1.1	7.9	9.0
		%	0	100.0	100.0
	1000-3000	Observed	7	64	71
		Expected	8.6	62.4	71.0
		%	9.9	90.1	100.0
	3000-6000	Observed	4	25	29
		Expected	3.5	25.5	29.0
		%	13.8	86.2	100.0
	< 6000	Observed	3	9	12
		Expected	1.4	10.6	12.0
		%	25.0	75.0	100.0

Income*Collect/Do Not Collect Crosstabulation – Birch Boughs

NTFP	Income Level (Rubles/Mo.)	Count	Collect	Do Not Collect	Total
Birch Boughs	0	Observed	9	11	20
		Expected	5.4	14.6	20.0
		%	45.0	55.0	100.0
	>1000	Observed	0	9	9
		Expected	2.4	6.6	9.0
		%	0	100.0	100.0
	1000-3000	Observed	18	53	71
		Expected	19.1	51.9	71.0
		%	25.4	74.6	100.0
	3000-6000	Observed	8	21	29
		Expected	7.8	21.2	29.0
		%	27.6	72.4	100.0
	< 6000	Observed	3	9	12
		Expected	3.2	8.8	12.0
		%	25.0	75.0	100.0

Income*Collect/Do Not Collect Crosstabulation – Chaga

NTFP	Income Level (Rubles/Mo.)	Count	Collect	Do Not Collect	Total
Chaga	0	Observed	2	18	20
		Expected	0.9	19.1	20.0
		%	10.0	90.0	100.0
	>1000	Observed	0	9	9
		Expected	0.4	8.6	9.0
		%	0	100.0	100.0
	1000-3000	Observed	2	69	71
		Expected	3.0	68.0	71.0
		%	2.8	97.2	100.0
	3000-6000	Observed	0	29	29
		Expected	1.2	27.8	29.0
		%	0	100.0	100.0
	< 6000	Observed	2	10	12
		Expected	0.5	11.5	12.0
		%	16.7	83.3	100.0